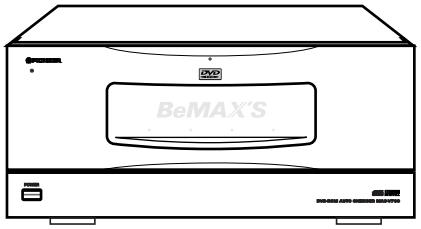
Service Manual



ORDER NO.
RRV2009

DVD-ROM AUTO CHANGER

MAC-V700

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	MAC-V700		
TLW/TA/HK	O	AC110 - 240V	

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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

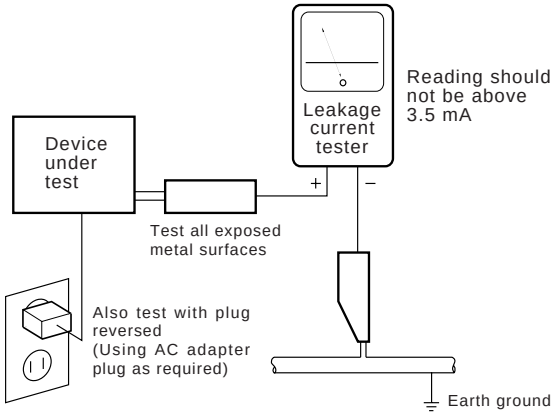
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 3.5 mA.


Leakage current tester
Reading should not be above 3.5 mA
Device under test
+
–
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage , etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

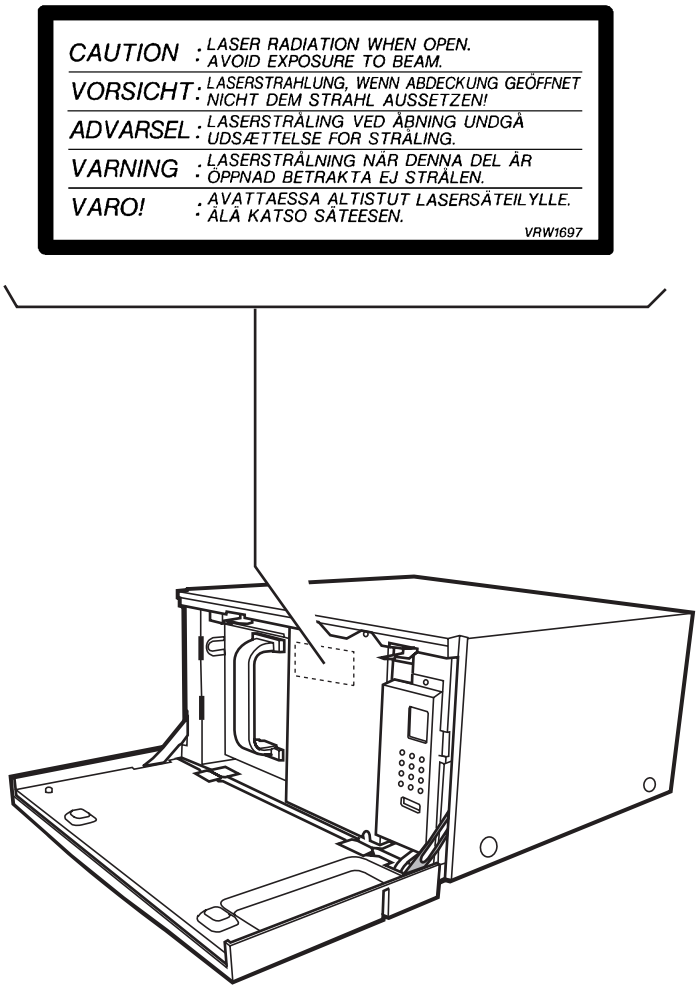
IMPORTANT

THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS

MAXIMUM OUTPUT POWER: 7 mw
WAVELENGTH: 640 nm(DVD) , 780 nm(CD-ROM)

LABEL CHECK


CAUTION : LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
VORSICHT: LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETZEN!
ADVARSEL : LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARNING : LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN.
VARO! : AVATTAESSA ALTISTUT LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEN.
VRW1697

Additional Laser Caution

1. Laser Interlock Mechanism
   The position of the switch (S601) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch(S601) is not on CLAMP terminal side (CLAMP signal is OFF high level.)
   Thus, the interlock will no longer function if the switch(S601) is deliberately set to CLAMP terminal side. (low level).
   In the test mode* the interlock mechanism will not function.
   Laser diode oscillation will continue, if pin 13 of LA9700(IC102) on the DVPL board assy connected to high level, or else the terminais of Q111 or Q112 are shorted to each other .

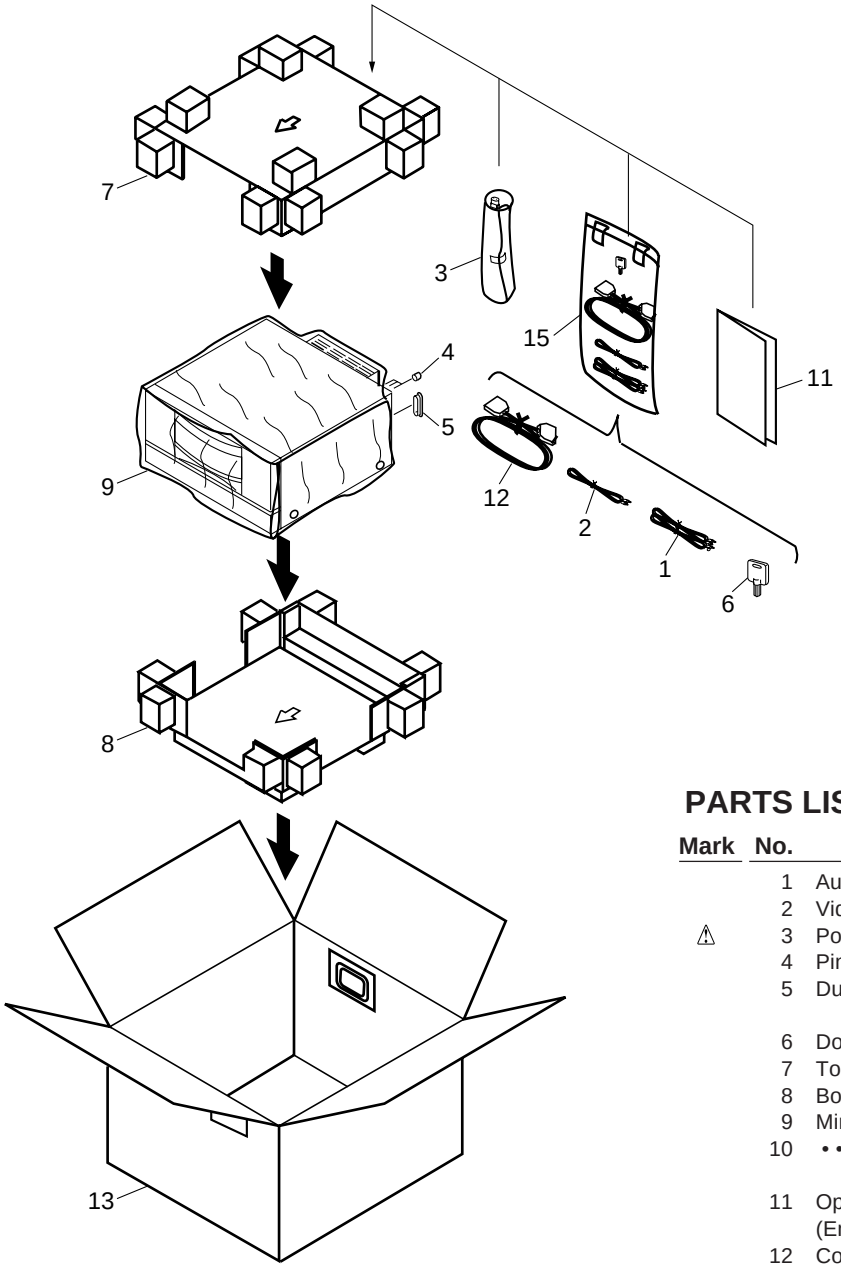
2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

* Refer to page 79.

2. EXPLODED VIEWS AND PARTS LIST

NOTES :
- *Parts marked by " NSP " are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Screw adjacent to ▼ mark on the product are used for disassembly.*

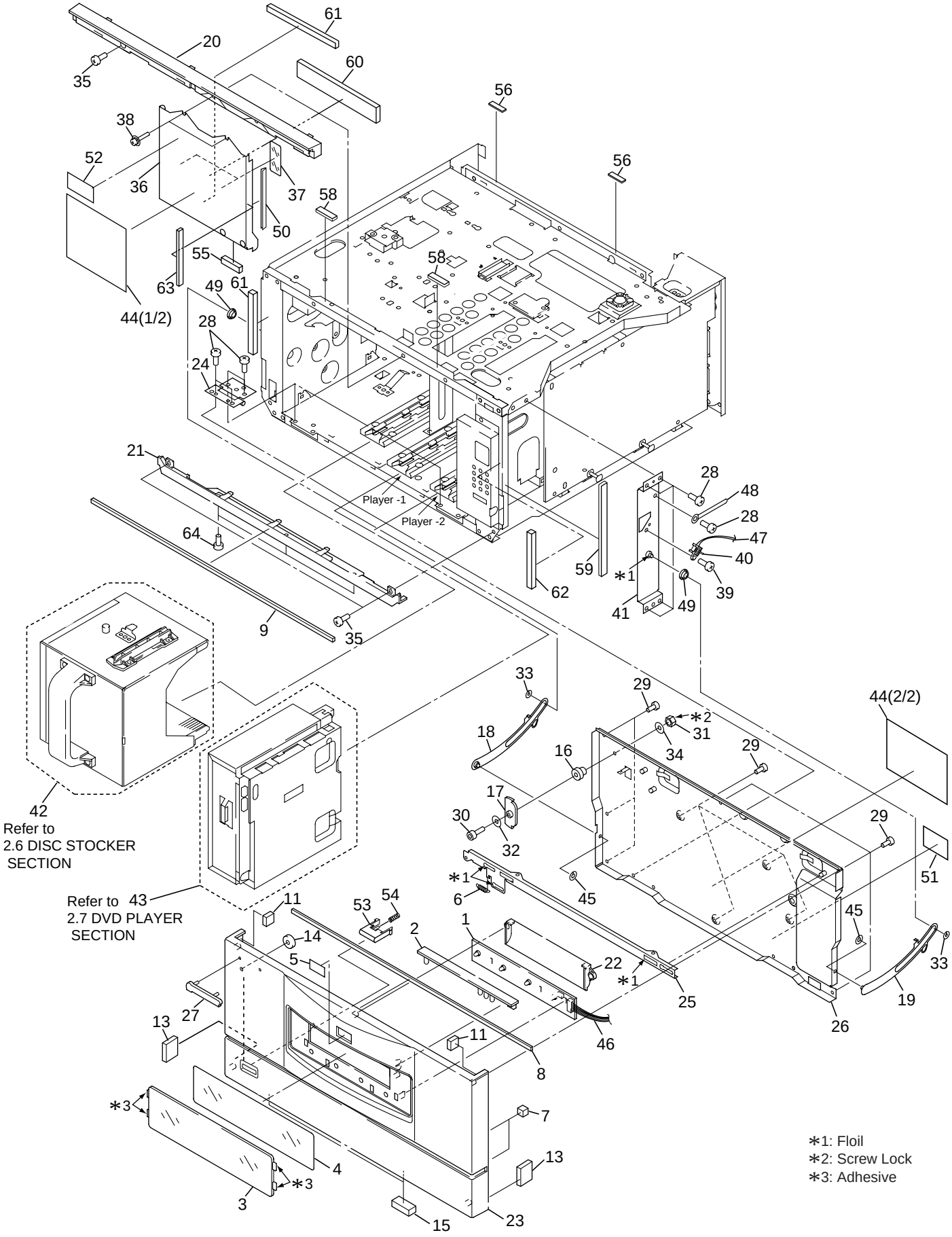
2.1 PACKING



PARTS LIST

Mark	No.	Description	Part No.
	1	Audio Cord (L= 2 m)	DDE1112
	2	Video Cord (L= 2 m)	ADE1059
⚠	3	Power Cord	DDG1079
	4	Pin Jack Cap	DEC2130
	5	Dust Cap	DEC2234
	6	Door Key	DNK1698
	7	Top Pad	DHA1406
	8	Bottom Pad	DHA1407
	9	Mirror Mat	VHL1014
	10	• • • • •	
	11	Operating Instructions (English/ Chinese)	DRB1230
	12	Control Cable (L= 2 m)	DDC1008
	13	Packing Case	DHG1838
	14	• • • • •	
	15	Polyethylene Bag	Z21-038

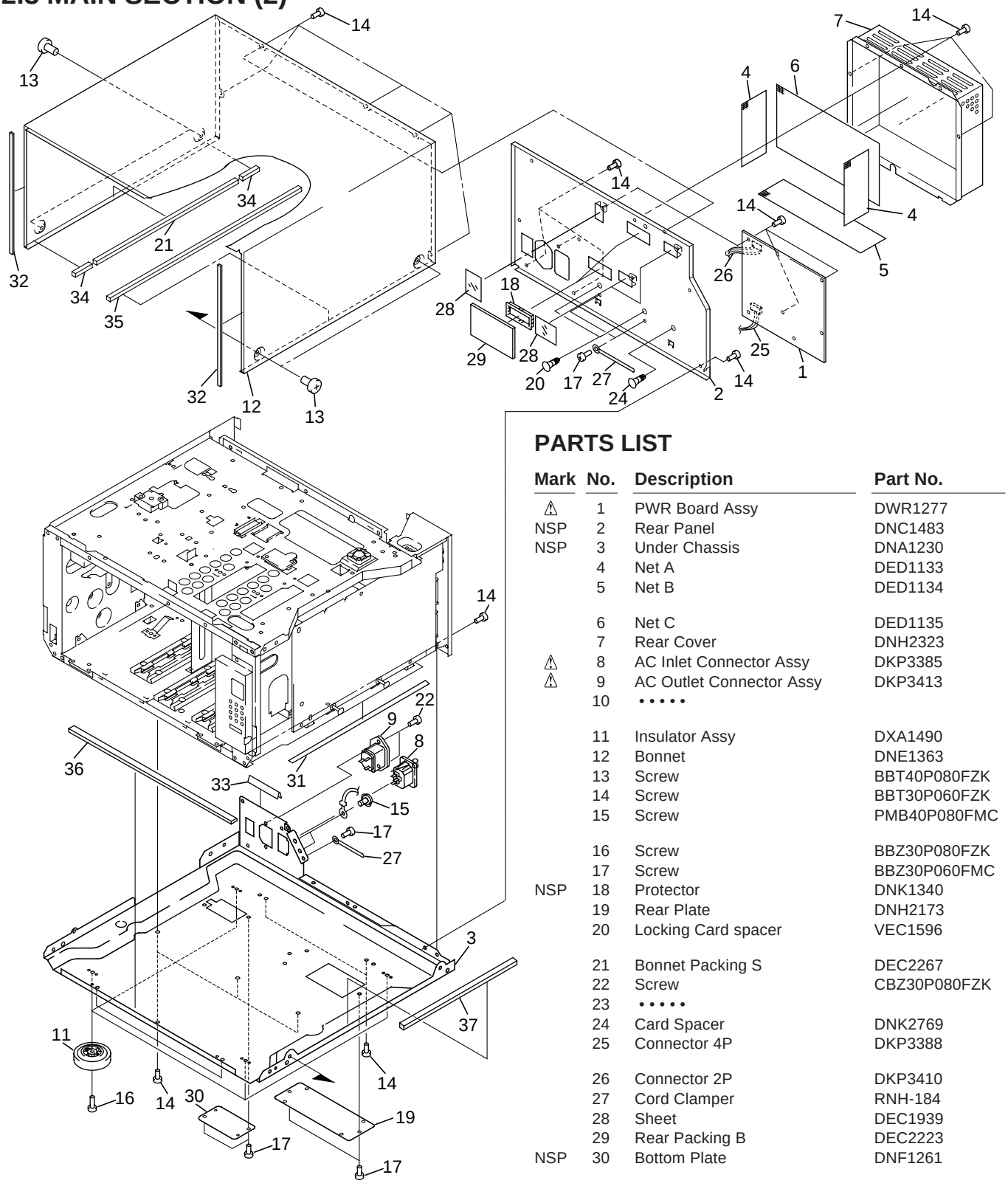
2.2 MAIN SECTION (1)



MAIN SECTION (1) PARTS LIST

Mark	No.	Description	Part No.
	1	INDB Board Assy	DWX1869
	2	ILMB Board Assy	DWX1870
	3	Display Window	DAH1878
	4	Display Sheet	DAH1879
	5	DVD Name Plate	DAM1079
	6	Door Lock Spring	DBH1408
	7	Cushion	DEB1393
	8	Door Packing A	DEC2245
	9	Door Packing B	DEC2218
	10	• • • • •	
	11	Door Packing D	DEC2220
	12	• • • • •	
	13	Door Packing E	DEC2226
	14	Door Packing F	DEC2227
	15	Door Packing G	DEC2241
	16	Collar	DLA1867
	17	Door Open Cam	DNH2324
	18	Door Arm L	DNH2346
	19	Door Arm R	DNH2347
	20	Escasion	DNK3545
	21	Under Cover	DNK3544
	22	Reflector	DNK3517
	23	Front Door	DNK3529
	24	Door Hinge Assy	DXB1669
	25	Door Lock Plate Assy	DXB1687
	26	Door Stay Assy	DXB1678
	27	Name Plate	BAM1003
	28	Screw	BBZ30P060FMC
	29	Screw	BPZ30P080FCU
	30	Screw	SMZ40H100FBT
	31	Nut	NB40FMC
	32	Washer	WB40FMC
	33	Washer	WT36D120D050
	34	Washer	WA62D095D050
	35	Screw	BBZ30P080FZK
	36	Front Cover	DNH2312
	37	Sheet	DEC2240
	38	Screw	PMB30P140FMC
	39	Screw	BBZ26P080FZK
	40	Lever Switch	DSK1003
NSP	41	Door Arm Stay R Assy	DXB1679
	42	Disc Stocker Assy (Service)	DXX2425
	43	DVD Player Unit	DXX2422
	44	Error Cord Label	DRW1909
	45	Ering	YE20FUC
	46	Connector Assy 9P	PF09PP-B90
	47	Connector Assy 2P	PF02PZ2B35
	48	Cord Clamper	RNH-184
	49	Roller	PNW2468
	50	Tape (124 x 10)	DED1117
NSP	51	Label	VRW1629
	52	Caution Label	VRW1697
	53	Power Knob	DAC1887
	54	Power Knob Spling	DBH1422
	55	EMI Gasket	DEC2274
	56	EMI Gasket	DEC2252
	57	• • • • •	
	58	EMI Gasket	DEC2255
	59	EMI Gasket	DEC2265
	60	Cavle Cushion	DEC2262
	61	EMI Gasket	DEC2272
	62	EMI Gusket	DEC2273
	63	EMI Gusket	DEC2277
	64	Screw	BBZ30P080FMC

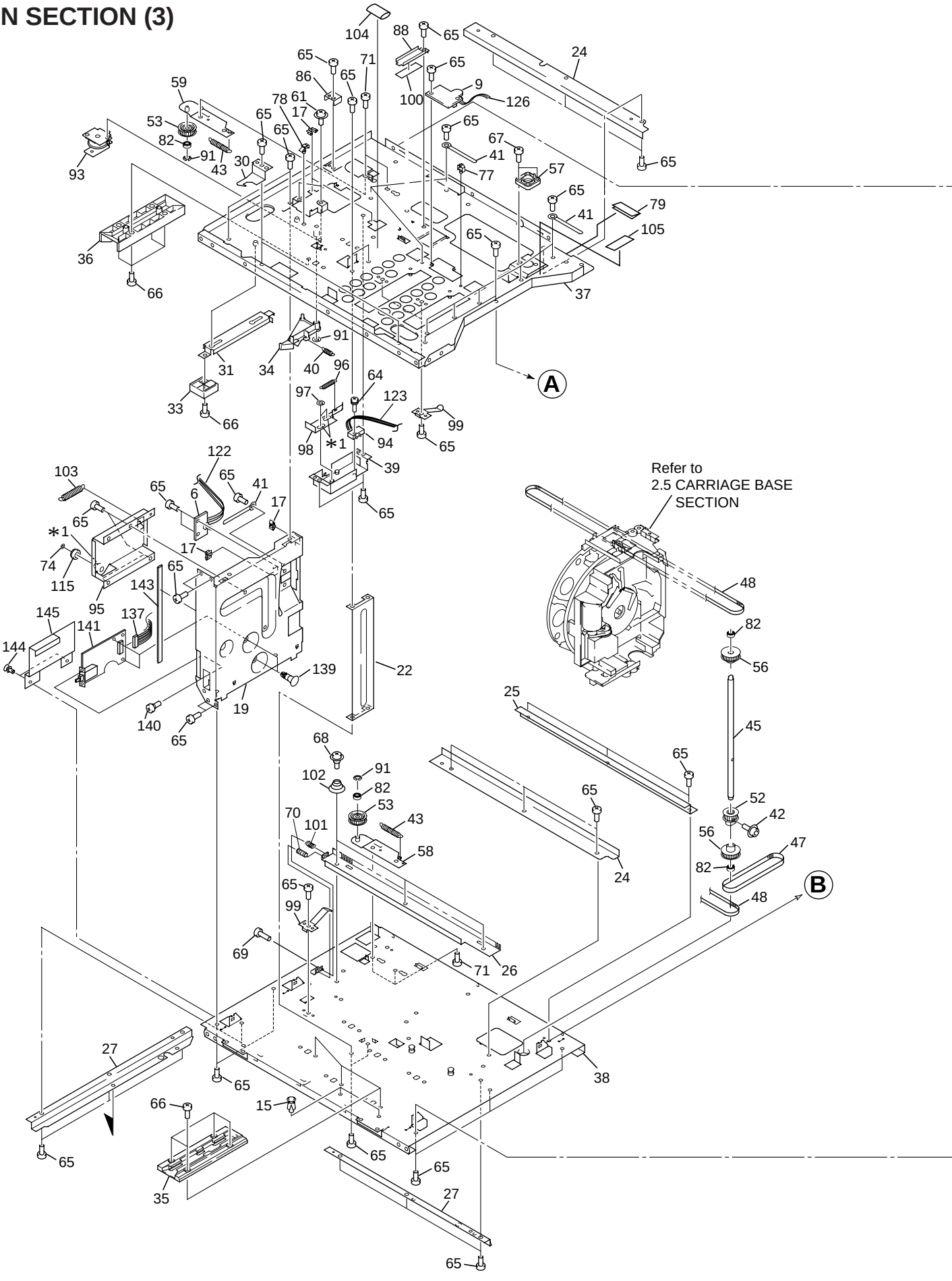
2.3 MAIN SECTION (2)

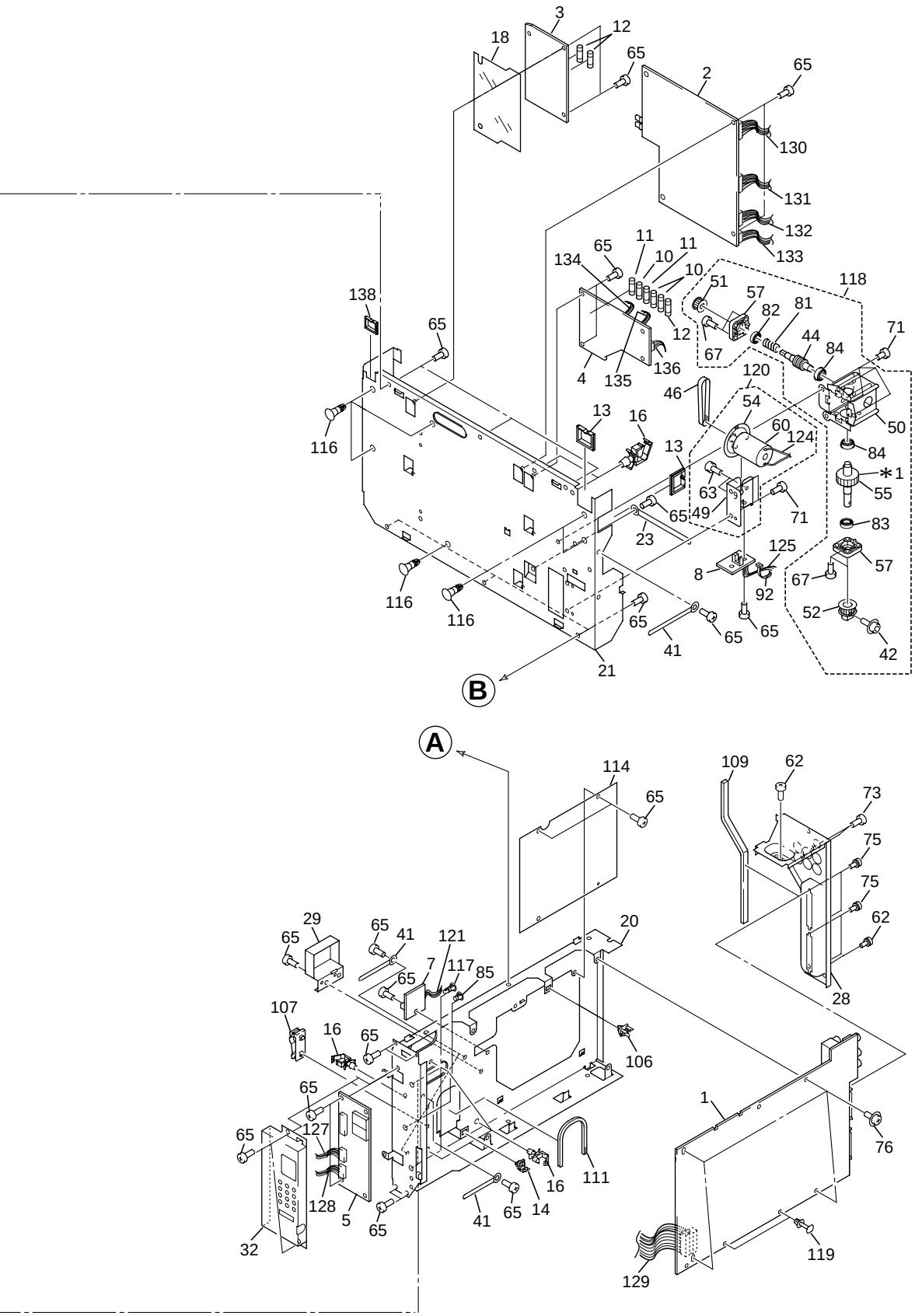


PARTS LIST

Mark	No.	Description	Part No.
⚠	1	PWR Board Assy	DWR1277
NSP	2	Rear Panel	DNC1483
NSP	3	Under Chassis	DNA1230
	4	Net A	DED1133
	5	Net B	DED1134
	6	Net C	DED1135
	7	Rear Cover	DNH2323
⚠	8	AC Inlet Connector Assy	DKP3385
⚠	9	AC Outlet Connector Assy	DKP3413
	10	• • • • •	
	11	Insulator Assy	DXA1490
	12	Bonnet	DNE1363
	13	Screw	BBT40P080FZK
	14	Screw	BBT30P060FZK
	15	Screw	PMB40P080FMC
	16	Screw	BBZ30P080FZK
	17	Screw	BBZ30P060FMC
NSP	18	Protector	DNK1340
	19	Rear Plate	DNH2173
	20	Locking Card spacer	VEC1596
	21	Bonnet Packing S	DEC2267
	22	Screw	CBZ30P080FZK
	23	• • • • •	
	24	Card Spacer	DNK2769
	25	Connector 4P	DKP3388
	26	Connector 2P	DKP3410
	27	Cord Clamper	RNH-184
	28	Sheet	DEC1939
	29	Rear Packing B	DEC2223
NSP	30	Bottom Plate	DNF1261
NSP	31	Tape	ZTA-PT1245-12
	32	Door Packing C	DEC2219
NSP	33	Edge Gard	DEC1409
	34	EMI Gasket	DEC2251
	35	EMI Gasket	DEC2266
	36	EMI Gasket	DEC2275
	37	EMI Gasket	DEC2276

2.4 MAIN SECTION (3)

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119
129

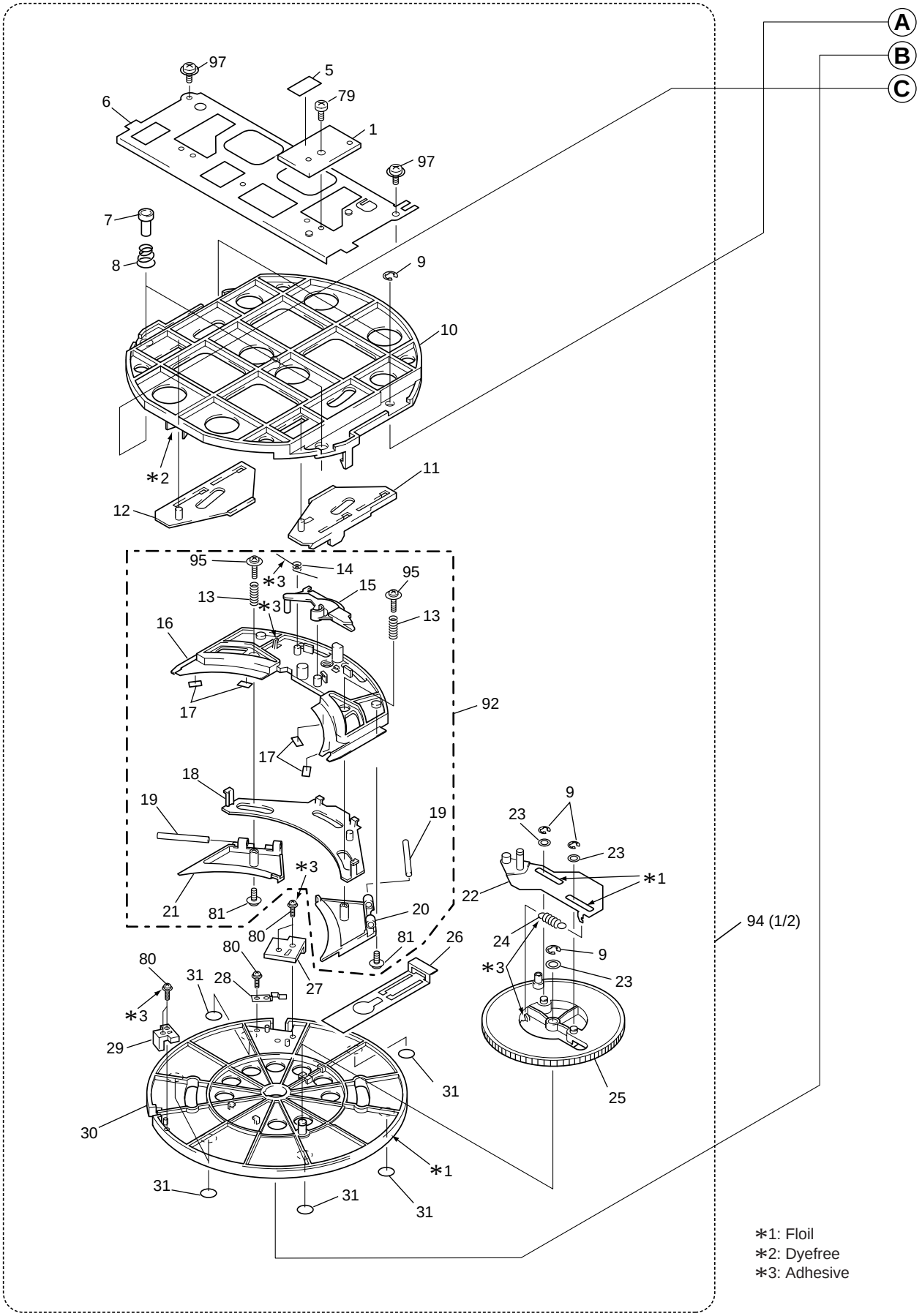
∗1: Floil

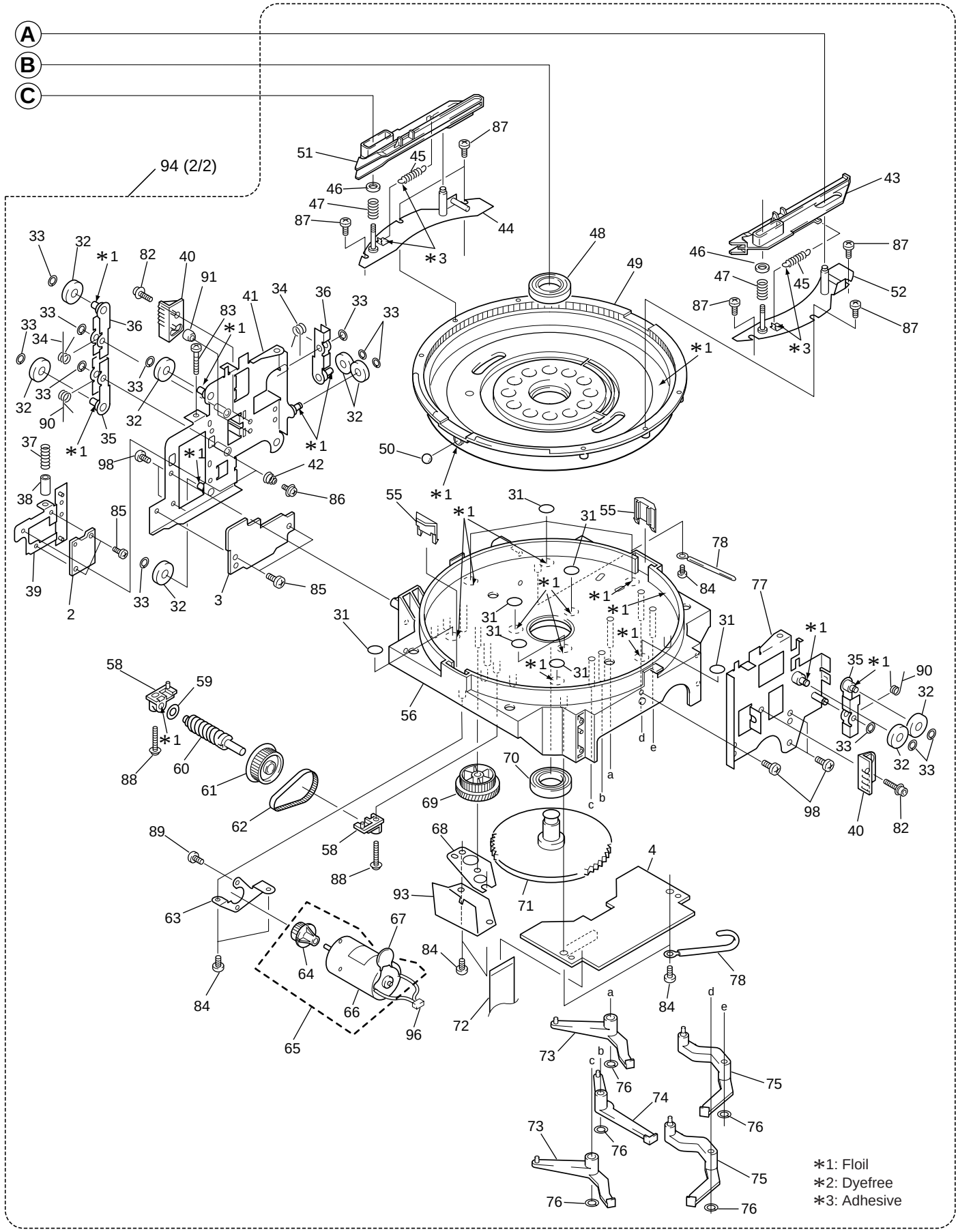
MAIN SECTION (3) PARTS LIST

Mark	No.	Description	Part No.
	1	DECB BOARD ASSY	DWG1500
	2	HMCB BOARD ASSY	DWG1501
	3	PWRP BOARD ASSY	DWR1292
	4	PWRS BOARD ASSY	DWR1293
	5	KEYB BOARD ASSY	DWX1862
	6	MD01 BOARD ASSY	DWX1866
	7	MD02 BOARD ASSY	DWX1867
	8	ENCB BOARD ASSY	DWX1868
	9	SNSB BOARD ASSY	DWX1873
⚠	10	Fuse (T1.25A:FU505,FU507,FU509)	AEK1055
⚠	11	Fuse (T2A:FU508,FU510)	AEK1057
⚠	12	Fuse (T2.5A:FU501,FU502,FU506)	AEK1058
NSP	13	Edge Guard (A)	DEC1143
	14	Pierce Hold	DEC1678
	15	Nylon Rivet	DEC1704
	16	Locking Wire Saddle	DEC1717
NSP	17	Edge Sadle	DEC1807
	18	Power Sheet	DEC2224
NSP	19	Mechanism Frame L	DNA1227
NSP	20	Mechanism Frame R	DNA1228
NSP	21	Rear Frame	DNA1229
	22	Bridge	DND1195
NSP	23	Cord Stopper	DNF1128
	24	FB Guide Plate S	DNH2313
	25	LR Guide Plate S	DNH2314
	26	EncodeR Plate S	DNH2315
NSP	27	Mechanism Plate	DNH2318
NSP	28	Terminal Plate	DNH2334
	29	Disc Sensor Plate	DNH2320
	30	Door Hook	DNH2321
	31	Release Arm	DNH2325
	32	Function Panel	DNH2330
	33	Release knob	DNK3242
	34	Magazin Lock Arm	DNK3243
	35	Slide Guide	DNK3244
	36	Rack Rail	DNK3323
NSP	37	Mechanism Frame U Assy	DXB1666
NSP	38	Mechanism Frame D Assy	DXB1667
	39	SW Holder Assy	DXB1670
	40	DS Lock SP	RBH1358
	41	Cord Clamper	RNH-184
	42	Bolt	DBA1099
	43	S Belt Spling	DBH1334
	44	Worm Gear	DLA1850
	45	Synchro Shaft	DLA1851
	46	S2M Belt (L150)	DMS1037
	47	S3M Belt (L213)	DMS1038
	48	S3M Belt (L699)	DMS1039
NSP	49	Motor plate	DNF1579
	50	Gear Box	DNF1582
	51	Motor Pulley	DNK3265
	52	D pulley S	DNK3267
	53	Upper Pulley	DNK3269
NSP	54	Motor Pulley S	DNK3507
	55	Worm Wheel	DNK3508
	56	Synchro Pulley	DNK3509
	57	Bearing Holder	DNK3513
	58	Up Holder L Assy	DXB1601
	59	Up Holder R Assy	DXB1602
	60	DC Motor	DXM1037
	61	Screw	AMZ30P060FMC
	62	Screw	BBT30P060FZK
	63	Screw	PMA30P040FCU
	64	Screw	DBA1021
	65	Screw	BBZ30P060FMC
	66	Screw	BBZ30P080FZK
	67	Screw	BBZ30P100FMC
	68	Screw	VBA1039
	69	Screw	BMZ26P120FMC
	70	Screw	DBA1081
	71	Screw	BMZ30P040FNI
	72	••••••••	
	73	Screw	BPZ30P080FCU
	74	Washer	WT36D120D050
	75	Screw	PMA26P050FMC
	76	Screw	IBZ30P060FMC
NSP	77	Clamp S	DEC1574
NSP	78	Clamp	VEC1597
	79	Sheet	VEX1022
	80	••••••••	
	81	Worm Gear Spring	DBH1435
	82	Bearing	DXB1672
	83	Bearing	DXB1673
	84	Bearing	DXB1680
NSP	85	Card Spacer	AEC7053
NSP	86	Panel Holder	DNH1614
	87	••••••••	
	88	Clamp	RNE1629
	89	••••••••	
	90	••••••••	
	91	Ering	YE30FUC
	92	Binder	Z09-056
⚠	93	Plunger	DXP1048
	94	Switch	VSF1005
NSP	95	Door Arm stay L Assy	DXB1674
	96	Door SW Spring	DBH1352
	97	Washer	WT26D060D050
	98	Door SW Plate	DNH2198
	99	Rack Earth Plate	DBK1109
	100	Cushion C	DEB1151

Mark	No.	Description	Part No.
	101	E Plate Spring S	DBH1406
	102	E Plate Spring	DBH1409
	103	Door Arm Spring L	DBH1411
	104	Clip	DEC1184
NSP	105	Edge Guard	DEC1409
NSP	106	Card Edge Spacer (4)	DEC1702
	107	Flat Cable Clamp	DEC1850
	108	••••••••	
	109	EMI Gasket	DEC2256
	110	••••••••	
	111	Gromet	DEC2233
	112	••••••••	
	113	••••••••	
NSP	114	Under Plate	DNF1587
	115	Roller	PNW2468
	116	Locking Card Spacer	ONK1035
NSP	117	PCB Holder	PNW1861
	118	Gear Box Assy	DXX2426
NSP	119	Card Spacer	REC1156
	120	VD Motor Assy-S	DXX2419
	121	Connector Assy 3P	PG03KK4G75
	122	Connector Assy 2P	PG02KK2G40
	123	Connector Assy 2P	DKP3395
	124	Connector Assy 2P	DKP3393
	125	Connector Assy 3P	PG03KK2G10
	126	Connector Assy 3P	PG03KK4G42
	127	Connector Assy 10P	PF10PP-B80
	128	Connector Assy 9P	PG09KK-G42
	129	Connector Assy 40P	DKP3401
	130	Connector Assy 4P	DKP3389
	131	Connector Assy 3P	PF03PP-B40
	132	Connector Assy 8P	PF08PP2B65
	133	Connector Assy 8P	PF08PP4B70
	134	Connector Assy 4P	DKP3391
	135	Connector Assy 4P	DKP3392
	136	Connector Assy 4P	DKP3390
NSP	137	Connector Assy 4P	DKP3396
NSP	138	Edge Gard (B)	DEC1144
NSP	139	PCB Holder	PNW2029
	140	Screw	PMA30P060FMC
	141	PSWB BOARD ASSY	DWR1294
	142	••••••••	
	143	EMI Gasket	DEC2265
	144	Rivet	DEC1318
	145	SW Cover	DEC2225

2.5 CARRIAGE BASE SECTION

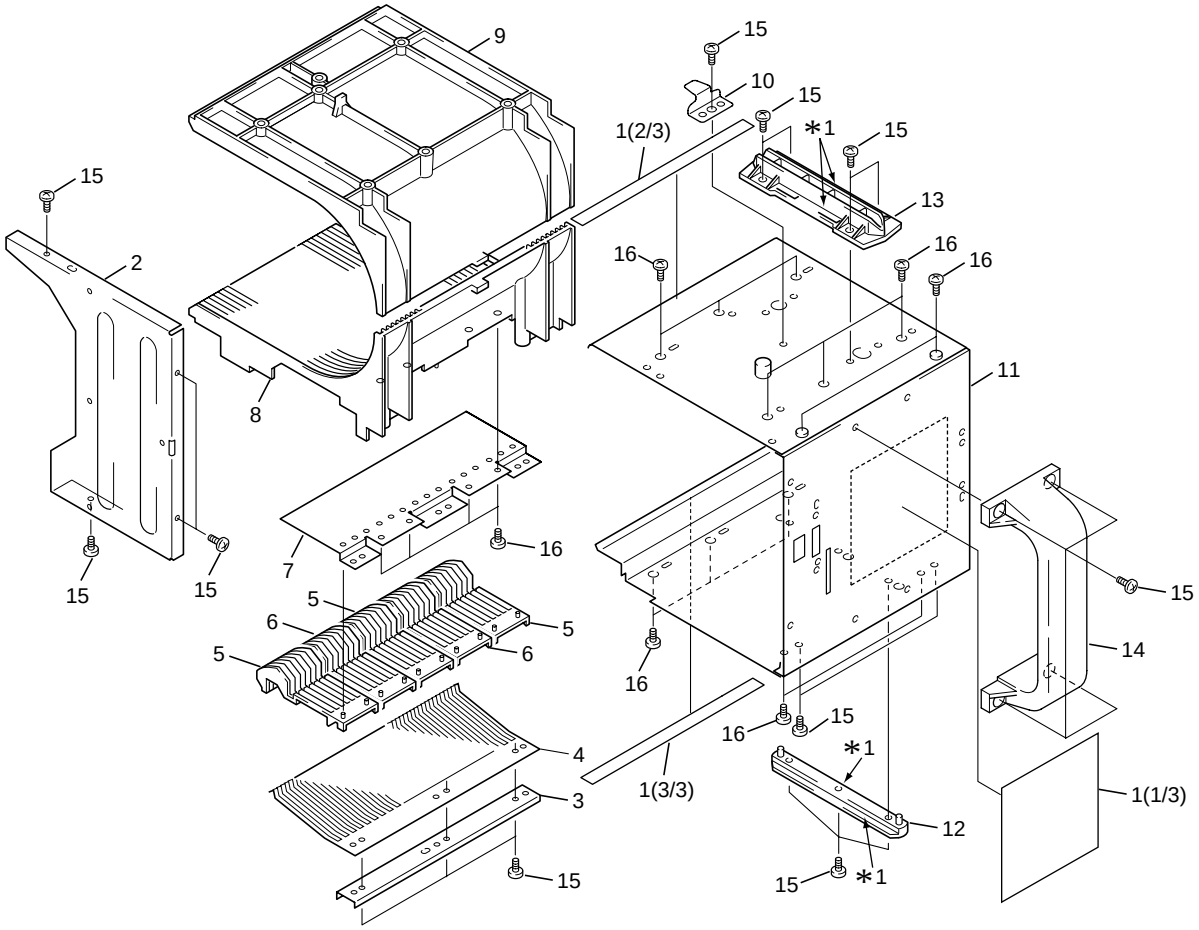



A
B
C
94 (2/2)
∗1: Floil
∗2: Dyefree
∗3: Adhesive

CARRIAGE BASE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	DSEB BOARD ASSY	DWX1707
	2	UPSE BOARD ASSY	DWX1709
	3	DNSE BOARD ASSY	DWX1708
	4	DCMB BOARD ASSY	DWX1706
	5	Damp Sheet	VEX1021
	6	Sensor Stay	DNH2205
	7	DG Height Pin	DLA1773
	8	D Guide Spring 2	DBH1407
	9	E Ring	YE25FUC
	10	Upper Plate	DNK3252
	11	Upper Slider L	DNK3274
	12	Upper Slider R	DNK3275
	13	Chuck Spring 1	DBH1336
	14	D Release Spring A	DBH1436
	15	D Release Arm	DNK3264
	16	Chuck A	DNK3580
	17	Rubber Sheet (100)	DEB1339
	18	Chuck Cam	DNK3263
	19	Chuck 2 Guide Shaft	DLA1772
	20	Chuck S (L)	DNK3480
	21	Chuck S (R)	DNK3481
	22	Arm Assy	DXB1616
	23	Washer	WA41D065D050
	24	Spring	DBH1338
	25	Gear	DNK3259
	26	Lock Plate	DBK1106
	27	Inner Piece (A)	DNK3361
	28	Ball Pressure	DBK1107
	29	Inner Piece (A)	DNK3360
	30	Inner Table	DNK3635
	31	Sheet	DEC2000
	32	Guide Roller	DLM1028
	33	Washer	WT31D054D050
	34	Guide Spring A	DBH1328
	35	Guide Plate B Assy	DXB1597
	36	Guide Plate A Assy	DXB1596
	37	Phase ADJ. Spring	DBH1331
	38	Bush	DLM1029
	39	Phase ADJ. Plate Assy	DXB1598
	40	Belt Stopper	DNK3298
	41	Side Plate LS assy	DXB1691
	42	ADJ. Plate Spring	DBH1330
	43	D Guide L	DNK3272
	44	DG Base (R) Assy	DXB1615
	45	D guide Spring 3	DBH1340
	46	D Guide Sleeve	DNK3284
	47	D Guide Spring 1	DBH1339
	48	Bearing	DXB1617
	49	Outer Table	DNK3250
	50	Steel Ball (6)	VNX1002
	51	D Guide R	DNK3273
	52	DG Base (L) Assy	DXB1614
	53	• • • • •	
	54	• • • • •	
	55	Ball Catcher	DNK3285
	56	Carriage Base	DNK3445
	57	• • • • •	
	58	Worm Stay	RNK2054
	59	Washer	WC40S
	60	Worm Gear S	DLA1270
	61	P2M Pulley L (32)	DNK3511
	62	P2M Belt (L84)	DMS1036
	63	Motor Stay 2	DNH1417
NSP	64	P2M Pulley S (15)	DNK3510
	65	Loading Motor Assy-S	DXX2420
	66	DC Motor	DXM1037
	67	Capacitor (C1)	CFTLA224J50
	68	HS Support	DNH2201
	69	SW Worm Wheel	DNK1842
	70	Bearing	DXB1618
	71	H Cam Gear	DNK3382
	72	Flexible Cord	DDD1128
	73	SW Arm B	DNK3277
	74	SW Arm A	DNK3276
	75	SW Arm C	DNK3278
	76	Washer	WT26D047D050
	77	Side Plate RS Assy	DXB1689
	78	Cord Clamper	RNH-184
	79	Screw	BBZ30P060FMC
	80	Screw	IPZ20P050FMC
	81	Screw	BPZ26P060FZK
	82	Bolt	VLL-378
	83	Screw	BMZ26P160FMC
	84	Screw	BPZ30P080FCU
	85	Screw	BMZ26P040FMC
	86	Screw	PBA-125
	87	Screw	PPZ26P080FMC
	88	Screw	IPZ30P160FMC
	89	Screw	PMA30P040FCU
	90	Guide Spring B	DBH1329
	91	Bush	DNK3318
	92	Chuck Assy (Service)	DXX2421
	93	Worm Cover	DEC2062
	94	Carriage Base Assy	DXX2418
	95	Screw	IPZ26P060FMC
	96	Connector Assy 2P	PF03PZ-D05
	97	Screw	PMB30P060FMC
	98	Screw	BBZ30P080FZK

2.6 DISC STOCKER SECTION (DXX2425)



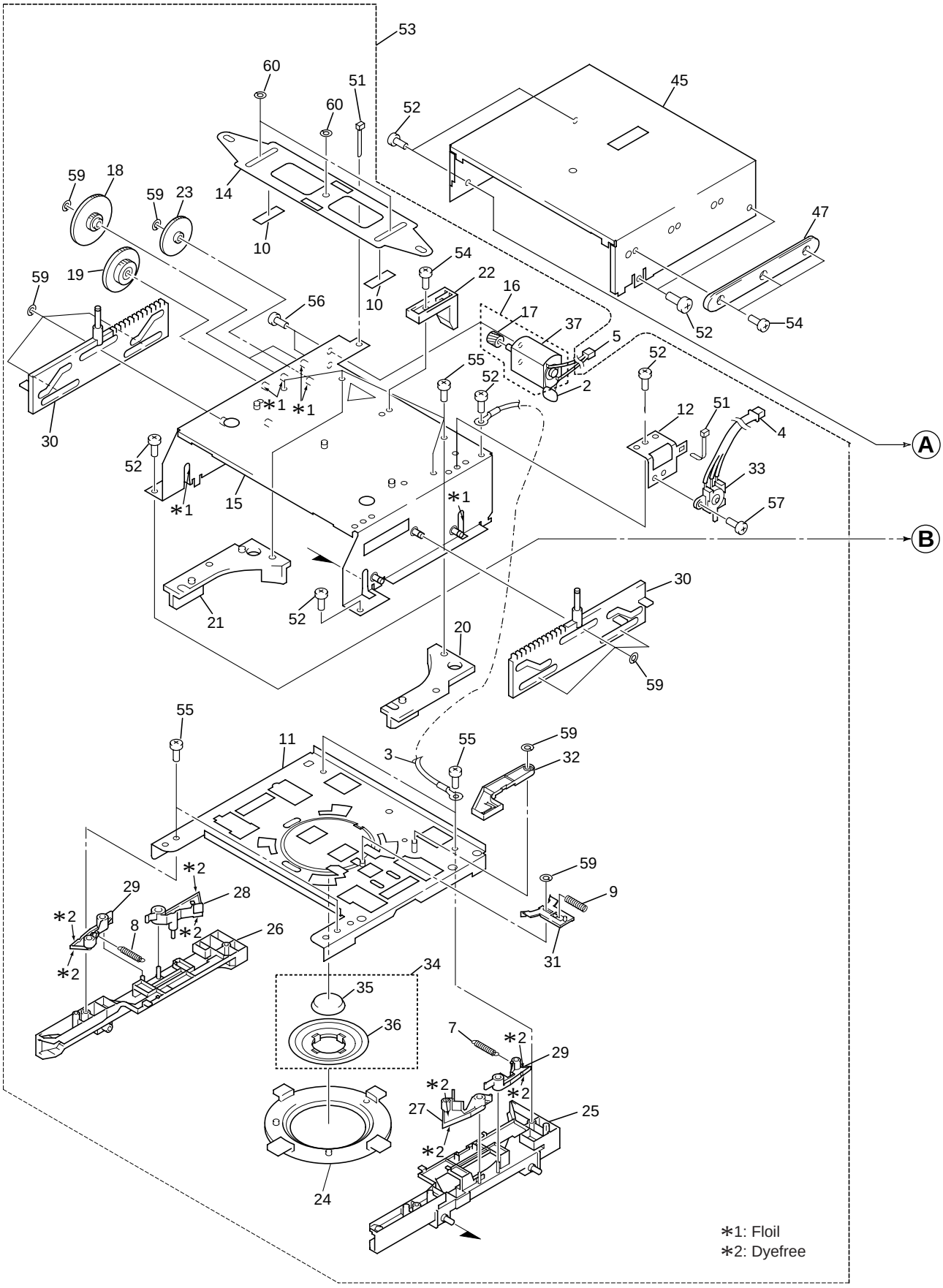
*1:Dyefree

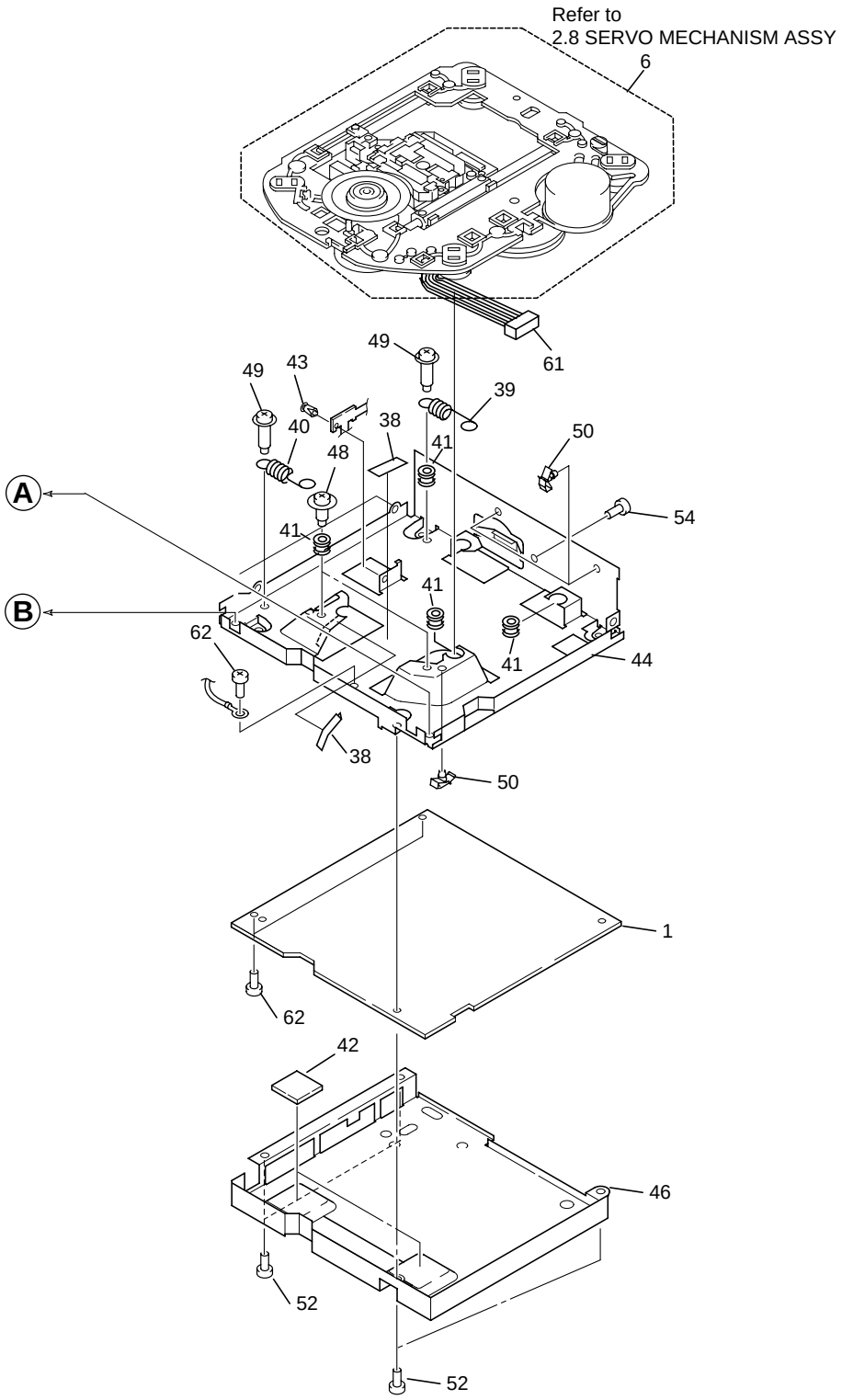
PARTS LIST

Mark	No.	Description	Part No.
	1	Disc Stocker Label	DRW1908
	2	Rack Base (B)	DNH2163
	3	Spring Holder	DNH2164
	4	Holder Stopper	RBK1049
	5	Disc Holder W	RNK2107
	6	Disc Holder R	RNK2108
	7	Holder Plate	RNE1616
	8	Disc Rack (L)	DNK3577
	9	Disc Rack (R)	DNK3578
	10	Rack SW Plate	DNH2327

Mark	No.	Description	Part No.
NSP	11	Rack Base (A) Assy	DXB1665
	12	Slide Rail	DNK3245
	13	DS Side Rail	DNK3324
	14	Grip	DNK3512
	15	Screw	BBZ30P080FZK
	16	Screw	BPZ30P080FCU

2.7 DVD PLAYER SECTION



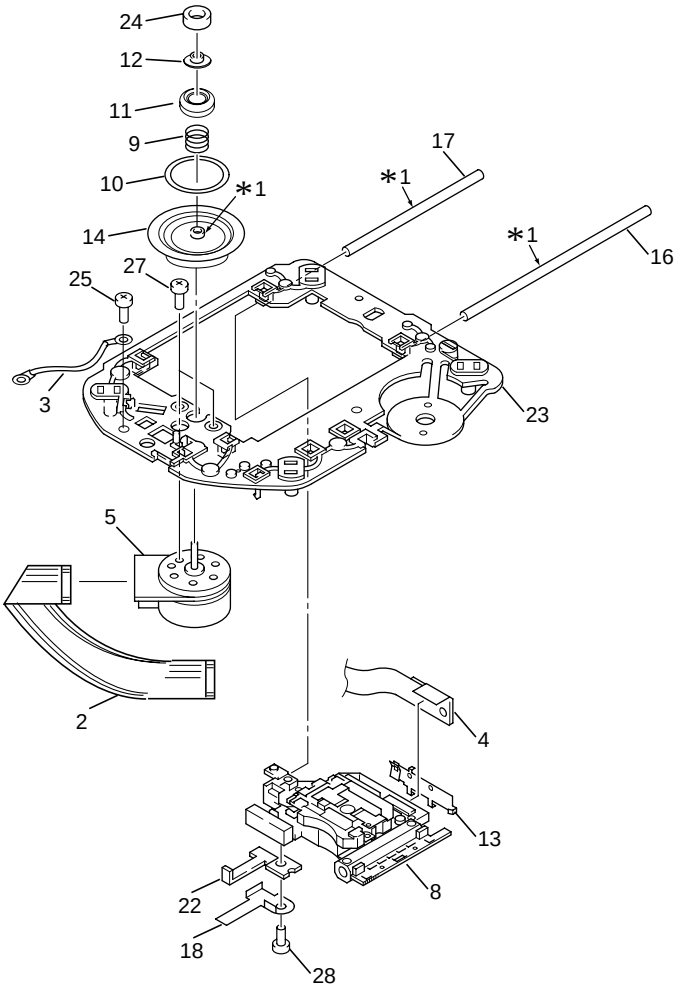

Refer to
2.8 SERVO MECHANISM ASSY
6
61
49
49
43
39
40
38
41
50
48
A
54
41
B
41
62
41
44
38
50
1
62
42
46
52
52

DVD PLAYER SECTION PARTS LIST

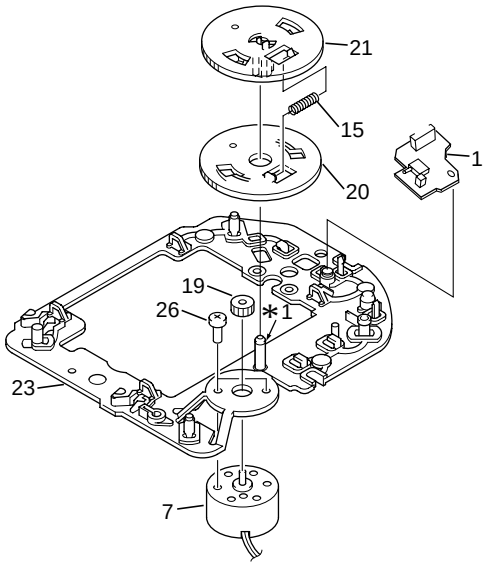
Mark	No.	Description	Part No.
	1	DVPL Board Assy	DWG1499
	2	Capacitor (C1)	CFTLA224J50
	3	Lead Wire Unit	DDF1008
	4	Connector Assy	DKP3281
	5	Connector Assy	PF02PY-B25
	6	Servo Mechanism Assy-S	DXX2423
	7	Disc Holder Spring A	DBH1414
	8	Disc Holder Spring B	DBH1418
	9	Clamper Link Spring	DBH1419
	10	Slide Sheet	DEC2034
	11	Clamper Stay	DND1212
	12	Switch Bracket	DNF1539
	13	••••••••	
	14	Joint Arm	DNH2284
	15	Clamper Base	DNH2332
	16	Clamp Motor Assy-S	DXX2336
	17	Motor Gear	DNK3254
	18	CL Gear (B)	DNK3256
	19	CL Gear (C)	DNK3257
	20	Disc Holder (L)	DNK3289
	21	Disc Holder (R)	DNK3290
	22	Disc Stopper	DNK3291
	23	CL Gear (A)	DNK3363
	24	Clamper Bracket	DNK3395
	25	Side Rack (A)	DNK3518
	26	Side Rack (B)	DNK3519
	27	Disc Holder A	DNK3520
	28	Disc Holder B	DNK3521
	29	Disc Holder C	DNK3522
	30	Rack Plate	DNK3523
	31	Clamper Link Plate A	DNK3524
	32	Clamper Link Plate B	DNK3525
	33	Lever Switch	DSK1003
	34	Clamper Assy	DXA1752
NSP	35	CLamper Plate	DNE1289
NSP	36	Clamper	DNK3094
NSP	37	Moter	PXM1002
	38	Tape (G)	REH1010
	39	Floating Spring A	DBH1415
	40	Floating Spring B	DBH1416
	41	Floating Rubber	DEB1340
	42	Silicon Rubber	DEB1341
	43	Rivet	DEC2041
	44	Player Base	DNA1231
	45	Cover A	DNF1584
	46	Cover B	DNF1585
	47	Slide Rail	DNK3245
	48	Floating Screw	RBA1061
	49	Step Screw	RBA1074
NSP	50	Mini Clamp	VEC1597
	51	Binder	ZCA-SKB90BK
	52	Screw	BBT30P060FZK
	53	Clamper Assy	DXX2424
	54	Screw	BBZ30P080FNI
	55	Screw	BBZ30P080FCU
	56	Screw	PMH20P040FMC
	57	Screw	PMH26P060FMC
	58	Screw	PMH20P040FMC
	59	Washer	WT26D047D050
	60	Washer	WT36D072D050
	61	Connector Assy	PG04MM-E10
	62	Screw	BBZ30P060FMC

2.8 SERVO MECHANISM ASSY

TOP VIEW



BOTTOM VIEW



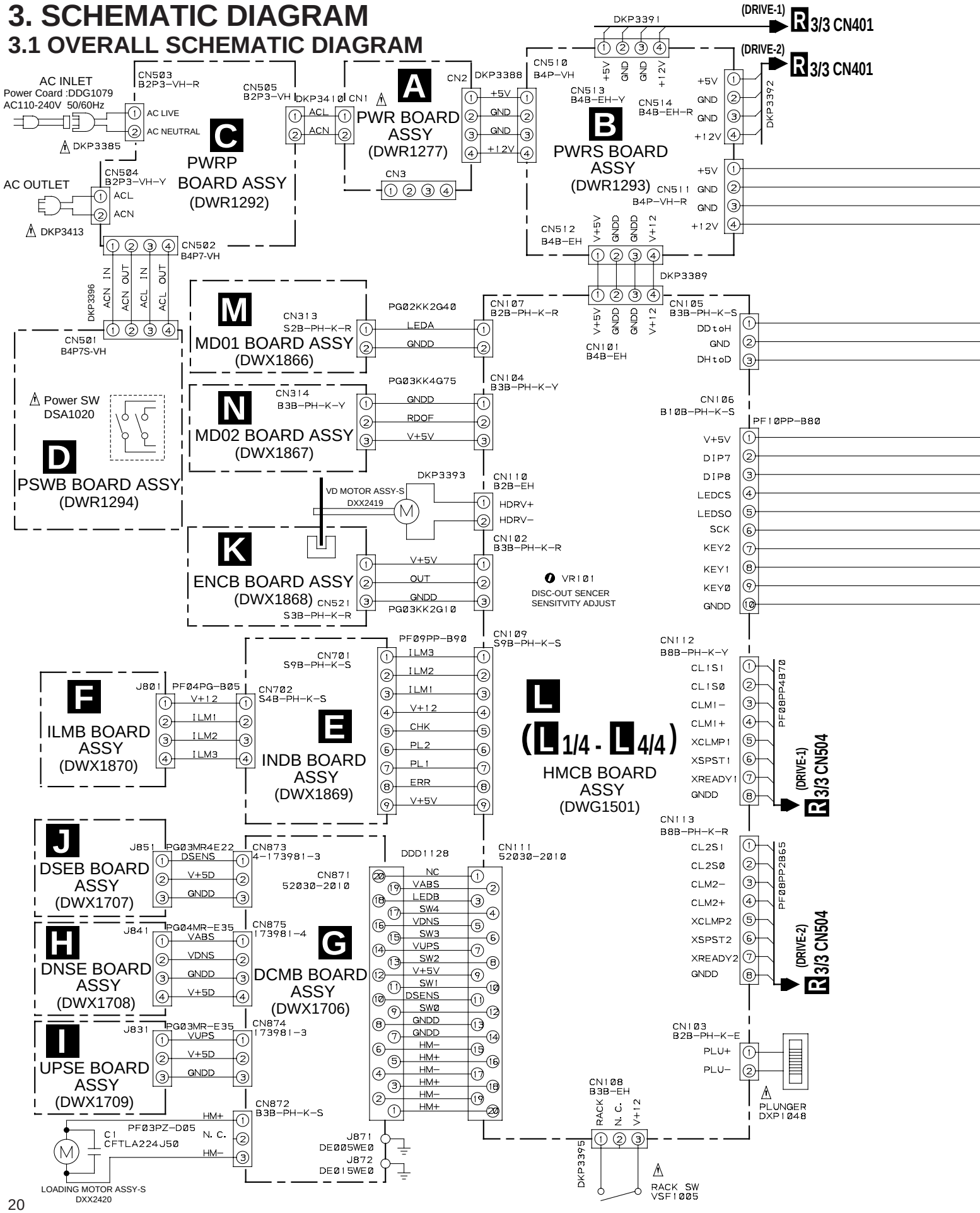
*1: Floil

SERVO MECHANISM PARTS LIST

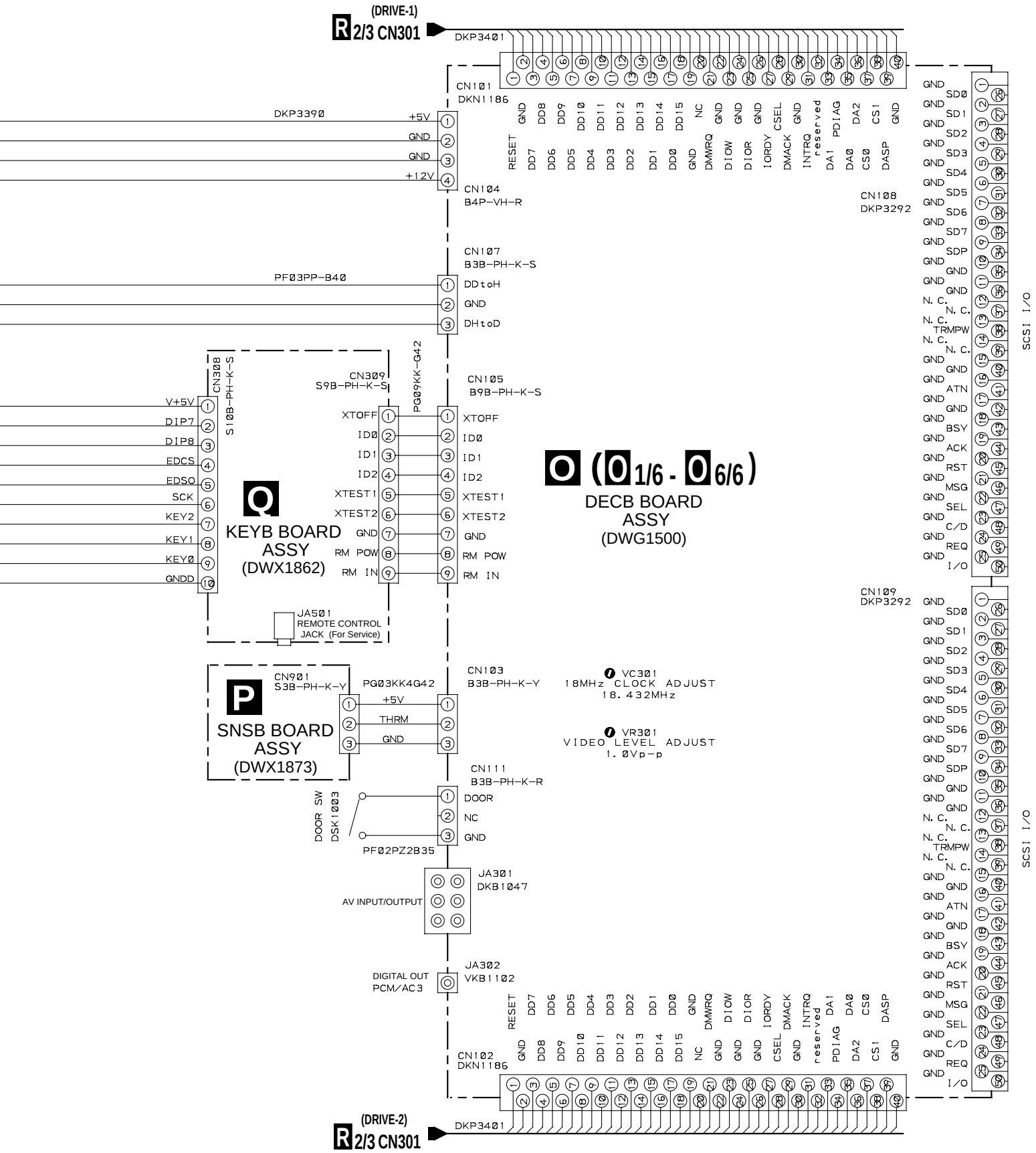
Mark	No.	Description	Part No.
NSP	1	INSB Assy	VWG1759
	2	Flexible Cord	DDD1129
	3	Lead Wire Unit	DDF1008
	4	Flexible Cable PU	DNP1786
NSP	5	Spindle Motor	DXM1094
	6	••••••••	
	7	Motor (SLD)	VXM1062
	8	Pickup Assy	VWY1046
	9	Centerring Spring	DBH1429
	10	Table Sheet	DEC2040
	11	Centerring Hub	DLA1864
	12	Bush	DLA1871
	13	Flexible Cable Holder	DNH2228
	14	Disc Table	DNK3528
	15	Gear Spring	VBH1306
	16	Guide Bar	VLL1488
	17	Sub Guide Bar	VLL1489
	18	Hold Spring	VNC1011
	19	Gear A	VNL1740
	20	Gear B	VNL1741
	21	Gear C	VNL1742
	22	Slider	VNL1745
NSP	23	Mechanism Base	VNL1800
	24	Magnet	VYM1024
	25	Screw	BBZ26P040FMC
	26	Screw	JGZ17P028FMC
	27	Screw	JGZ20P030FMC
	28	Screw	PBZ20P050FMC

3. SCHEMATIC DIAGRAM

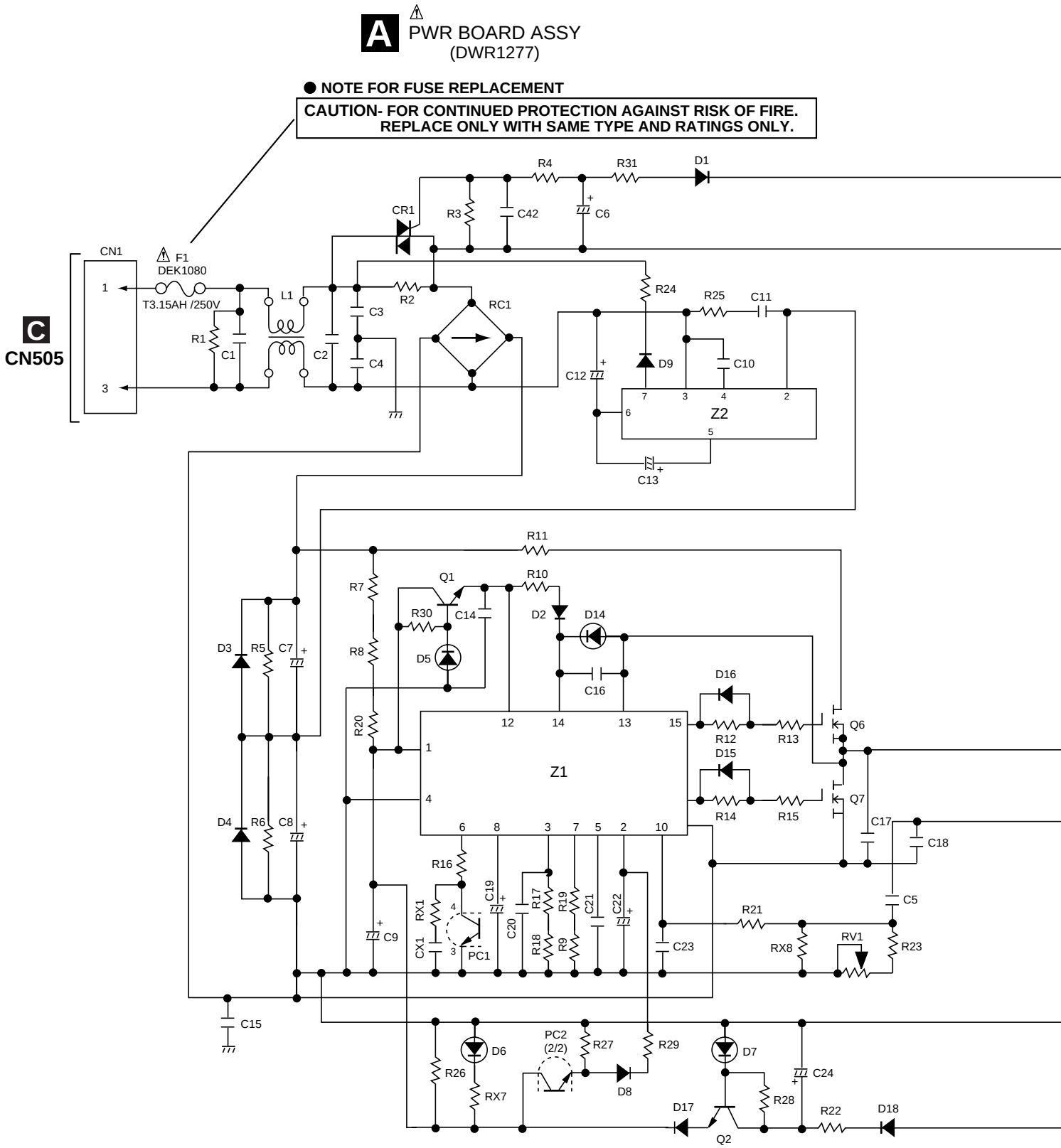
3.1 OVERALL SCHEMATIC DIAGRAM

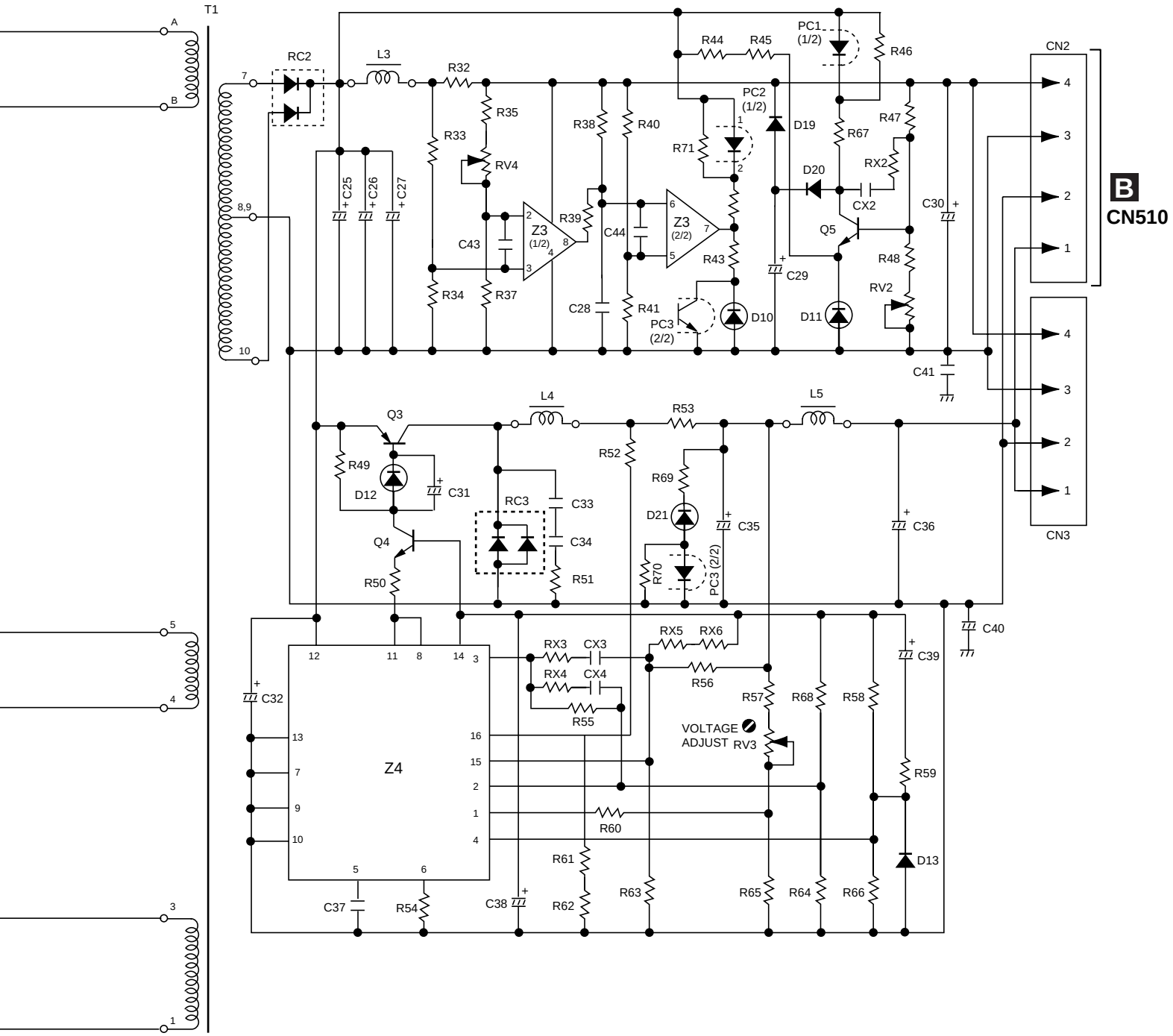


Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



3.2 PWR BOARD ASSY

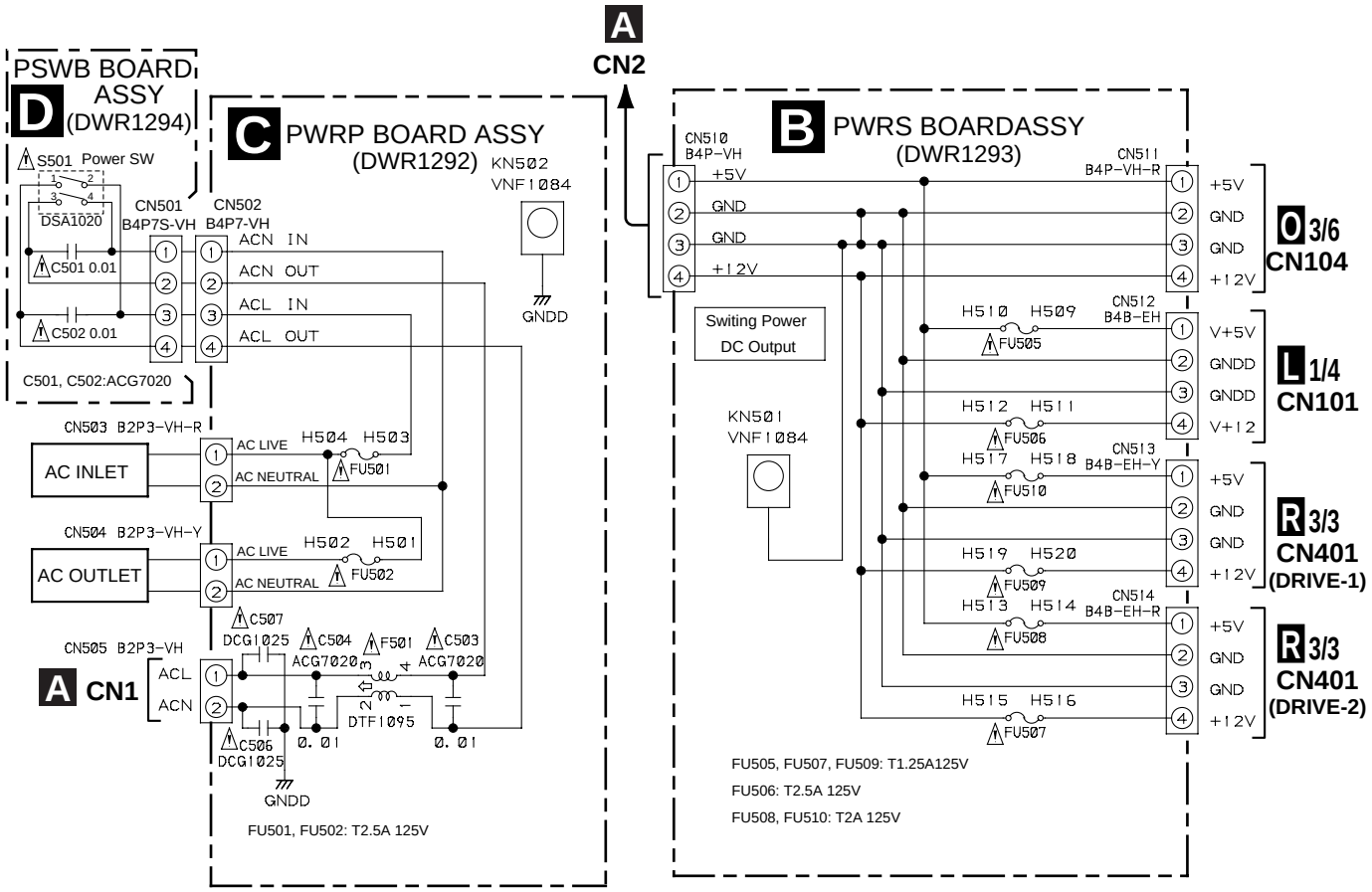


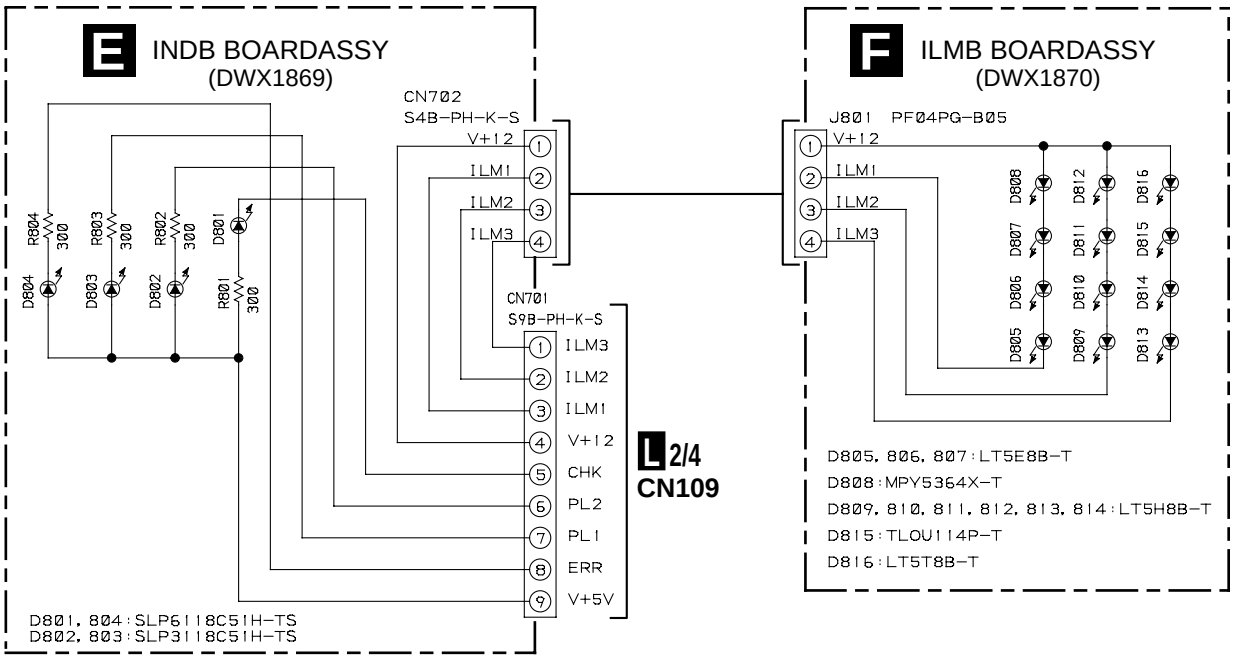

T1
RC2
L3
R32
R35
R33
RV4
R34
R37
C43
C25
C26
C27
Z3 (1/2)
R39
C44
Z3 (2/2)
R38
R40
R71
R43
C28
R41
PC3 (2/2)
D10
PC1 (1/2)
PC2 (1/2)
R44
R45
R46
D19
R67
R47
D20
RX2
CX2
Q5
R48
RV2
D11
C29
C30
C41
CN2
CN3
B
CN510
L4
L5
R53
Q3
R49
D12
C31
RC3
C33
C34
R51
Q4
R50
R52
R69
D21
C35
C36
R70
PC3 (2/2)
C40
RX3
CX3
RX4
CX4
R55
RX5
RX6
R56
R57
R68
R58
C39
VOLTAGE ADJUST
RV3
R59
Z4
R60
R61
R62
R63
R65
R64
R66
D13
C32
C37
R54
C38

3.3 PWRS, PWRP, PSWB, INDB and ILMB BOARD ASSY

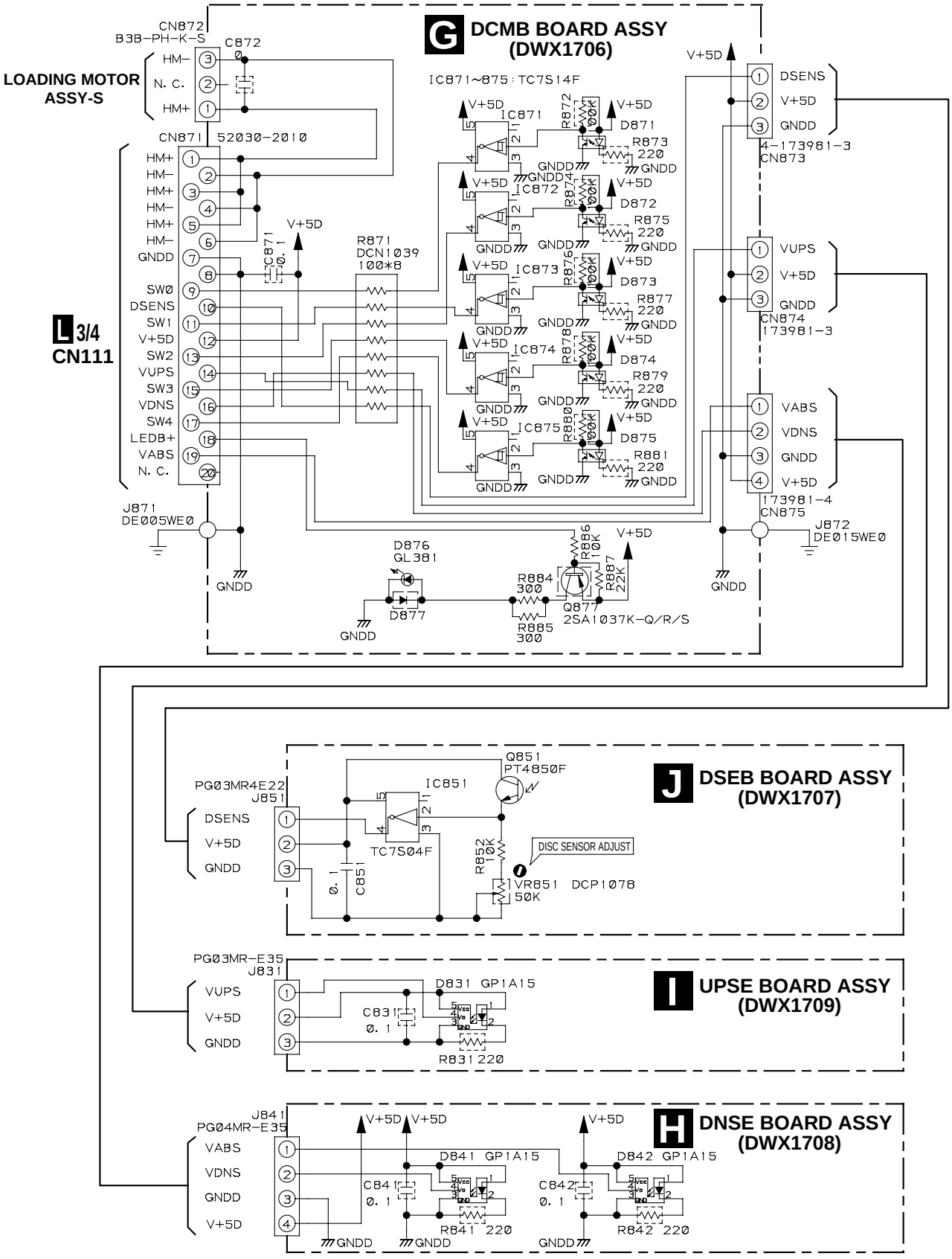
● NOTE FOR FUSE REPLACEMENT

CAUTION- FOR CONTINUED PROTECTION AGAINST RISK OF FIRE.
REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.

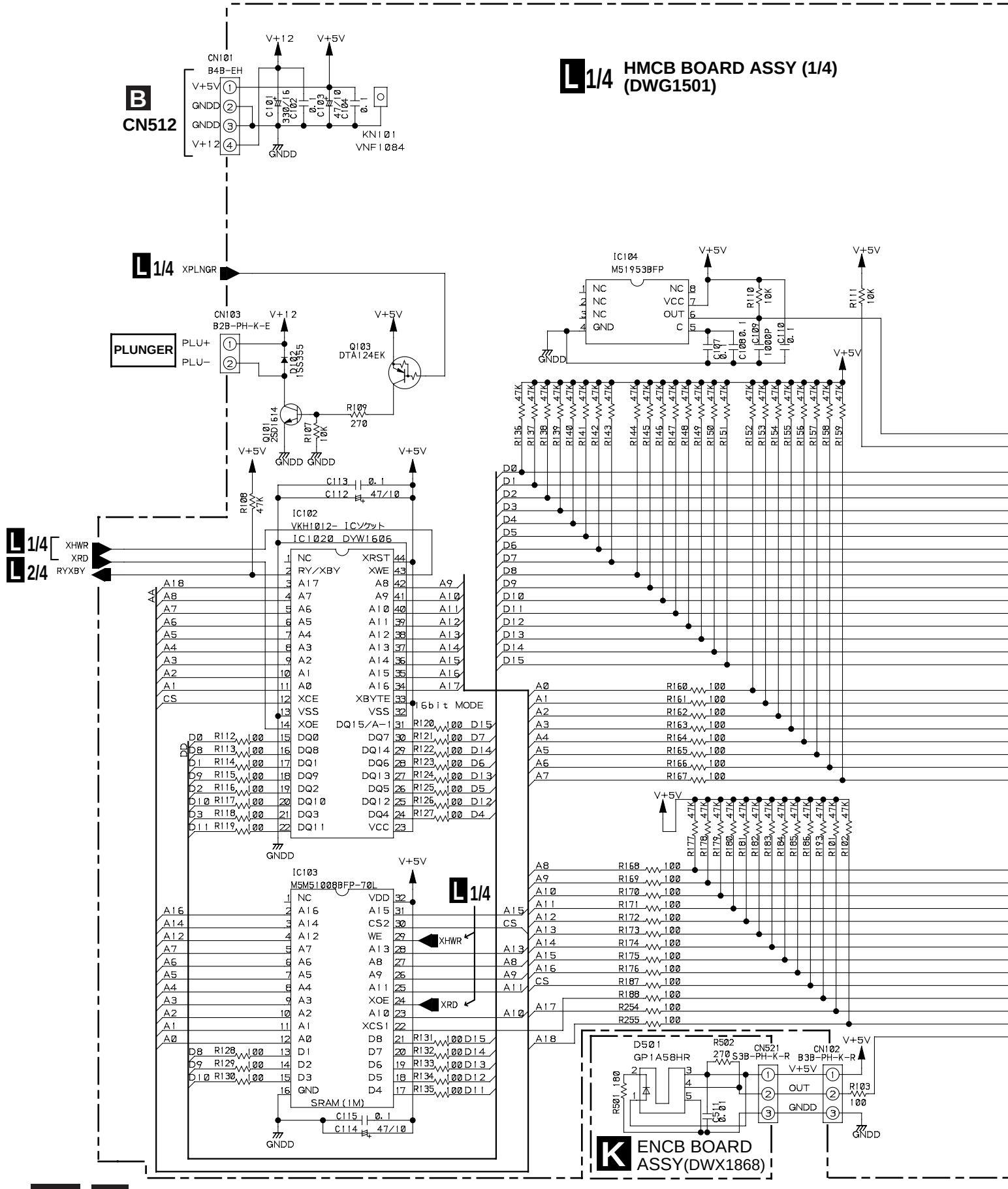


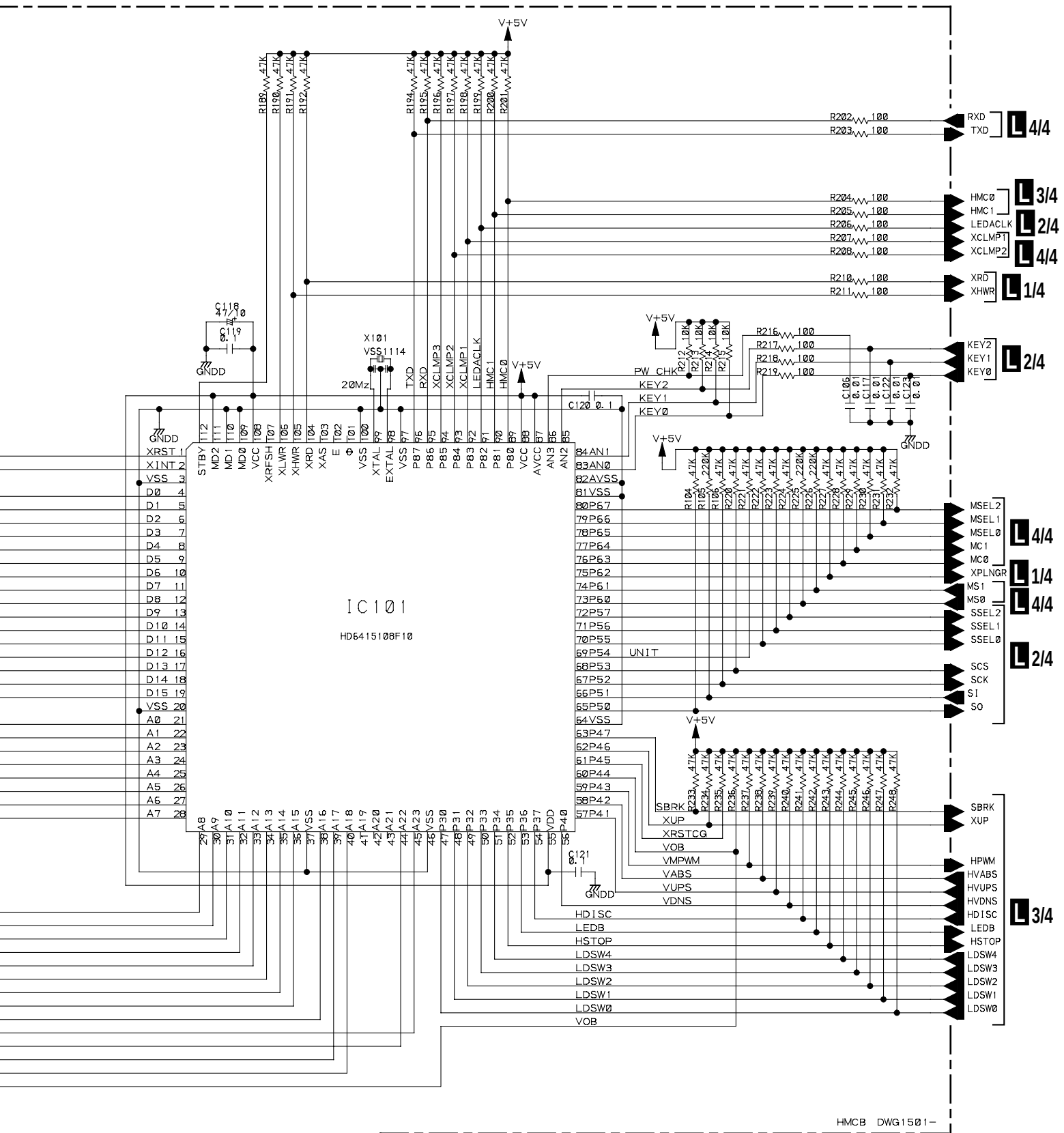


3.4 DCMB, DNSE, UPSE and DSEB BOARD ASSY

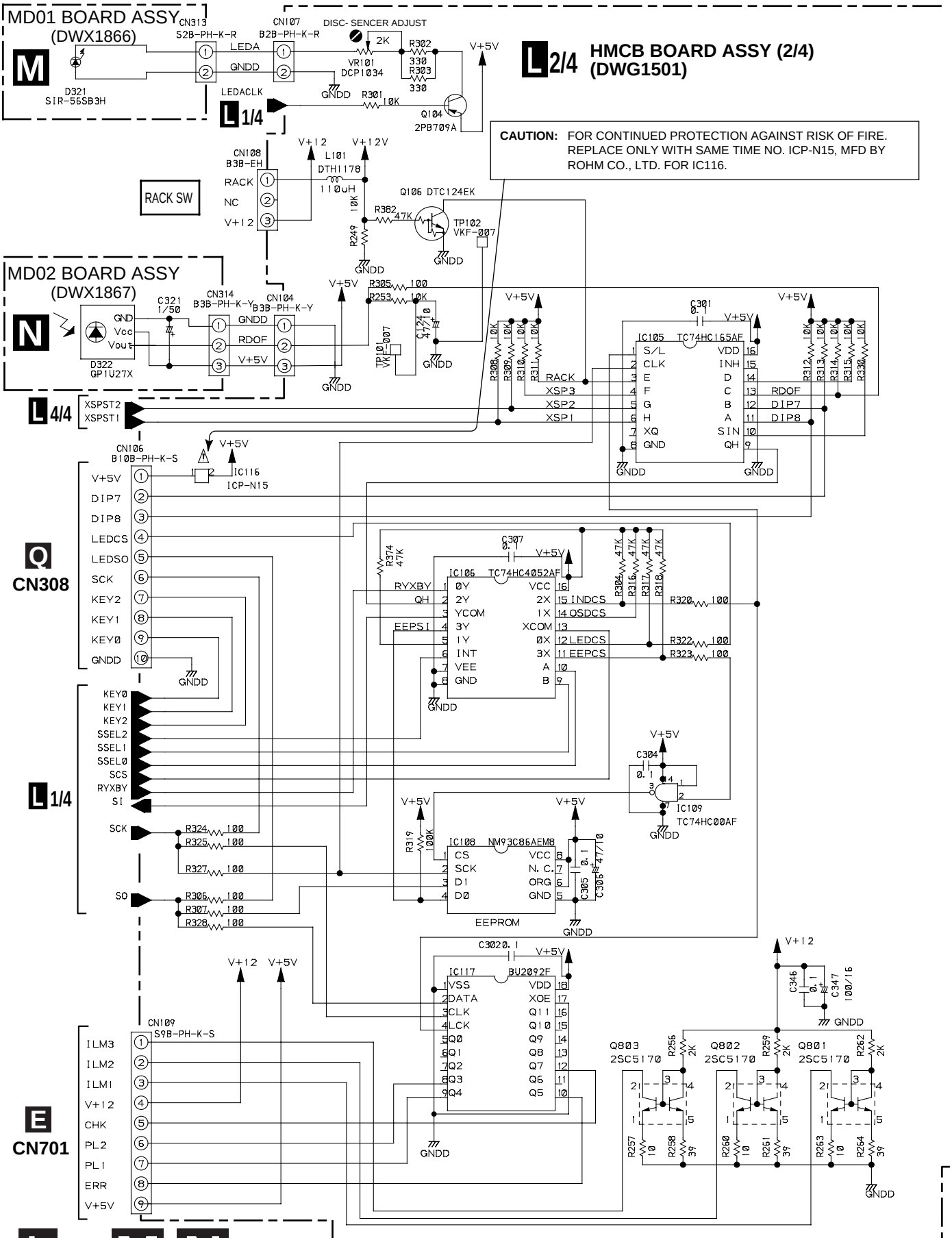


3.5 ENCB and HMCB (1/4) BOARD ASSY

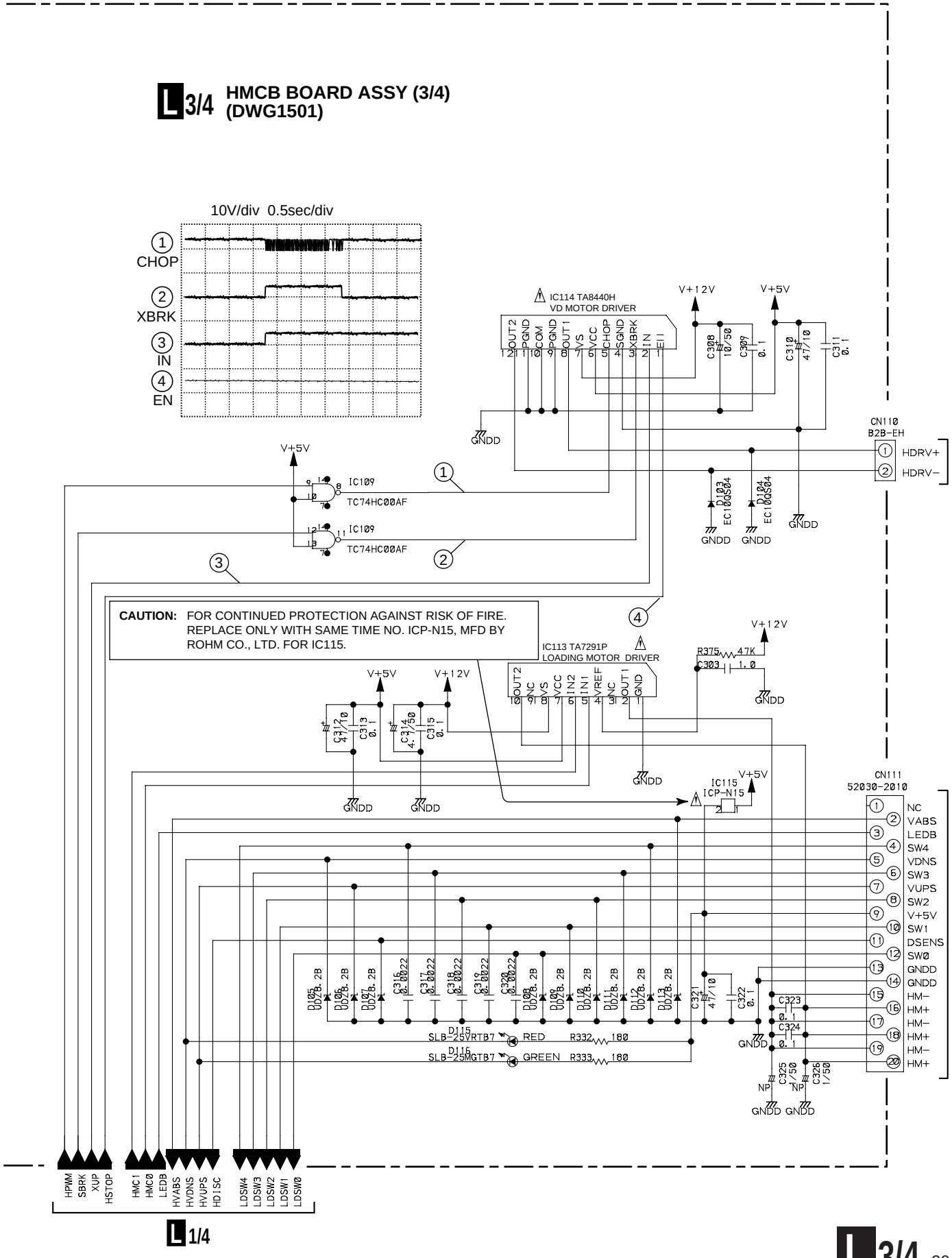



IC101
HD6415108F10
V+5V
GNDD
X101
20Mz
C118 47/10
C119 0.1
C120 0.1
C121 0.1
C106 0.01
C117 0.01
C122 0.01
C123 0.01
PW_CHK
KEY2
KEY1
KEY0
UNIT
HMCB DWG1501-
RXD
TXD
HMC0
HMC1
LEDACLK
XCLMP1
XCLMP2
XRD
XHWR
MSEL2
MSEL1
MSEL0
MC1
MC0
XPLNGR
MS1
MS0
SSEL2
SSEL1
SSEL0
SCS
SCK
SI
SO
SBRK
XUP
HPWM
HVABS
HVUPS
HVDNS
HDISC
LEDB
HSTOP
LDSW4
LDSW3
LDSW2
LDSW1
LDSW0
L 4/4
L 3/4
L 2/4
L 1/4

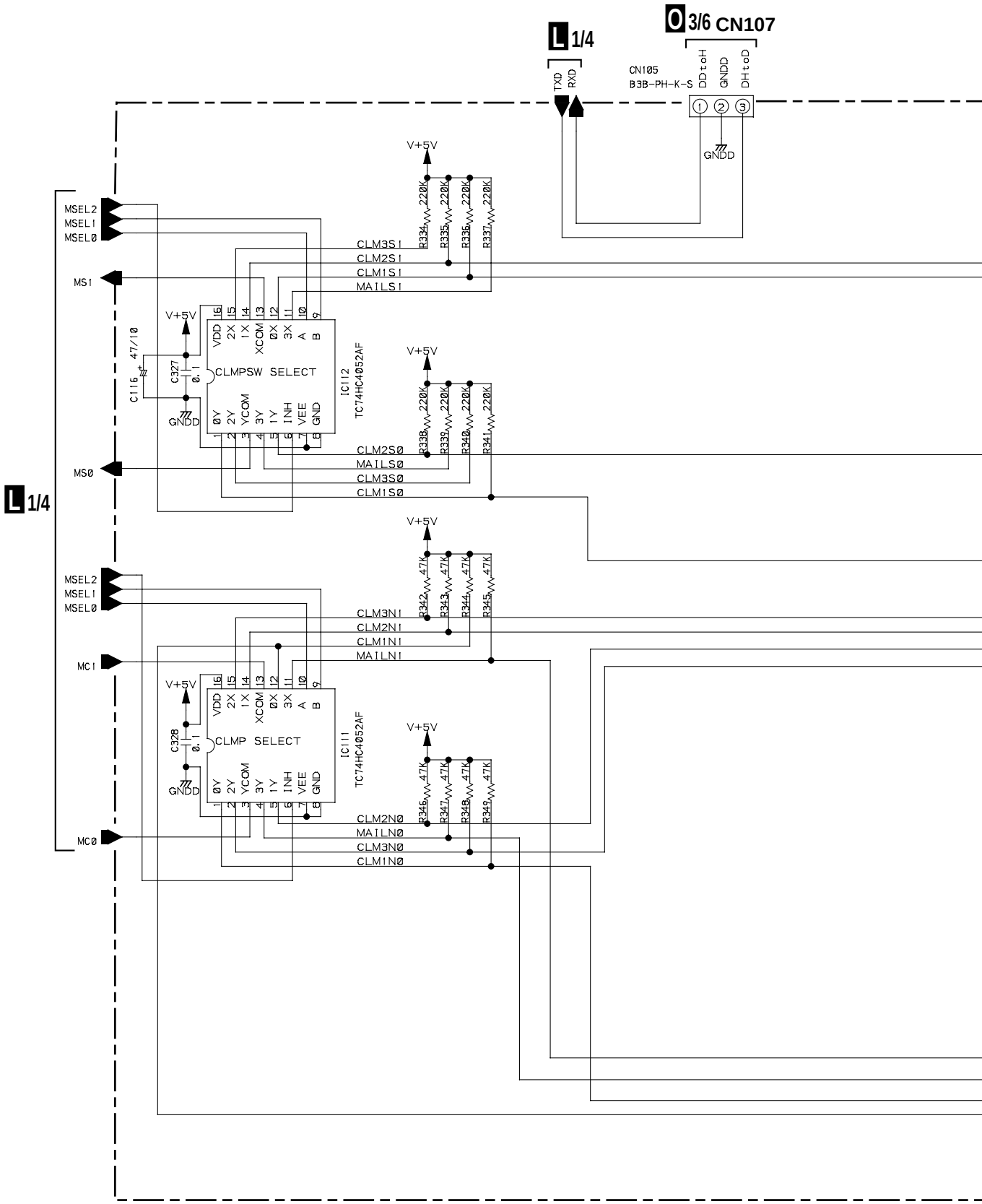
3.6 HMCB (2/4), MD01 and MD02 BOARD ASSY

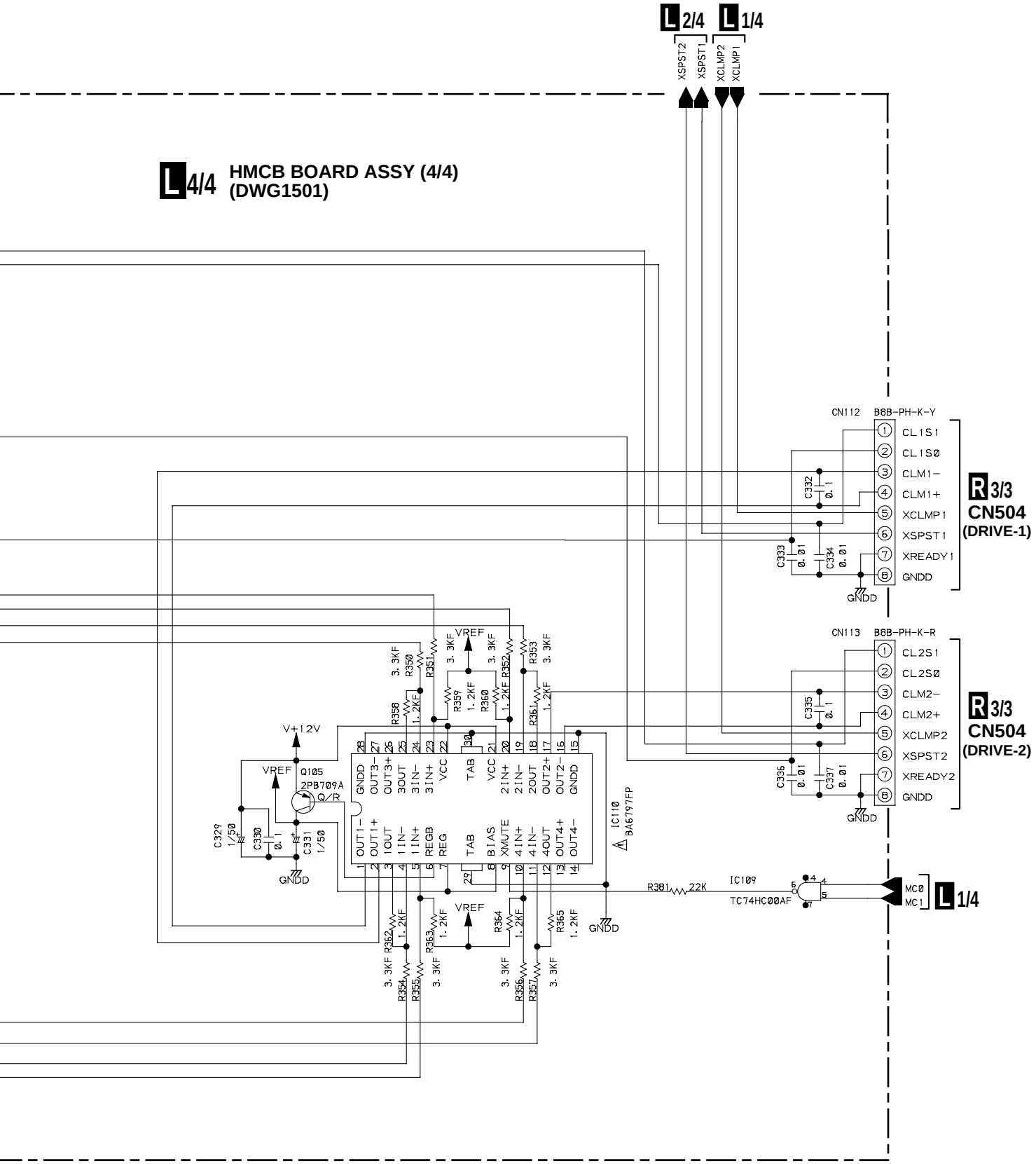


3.7 HMCB BOARD ASSY (3/4)

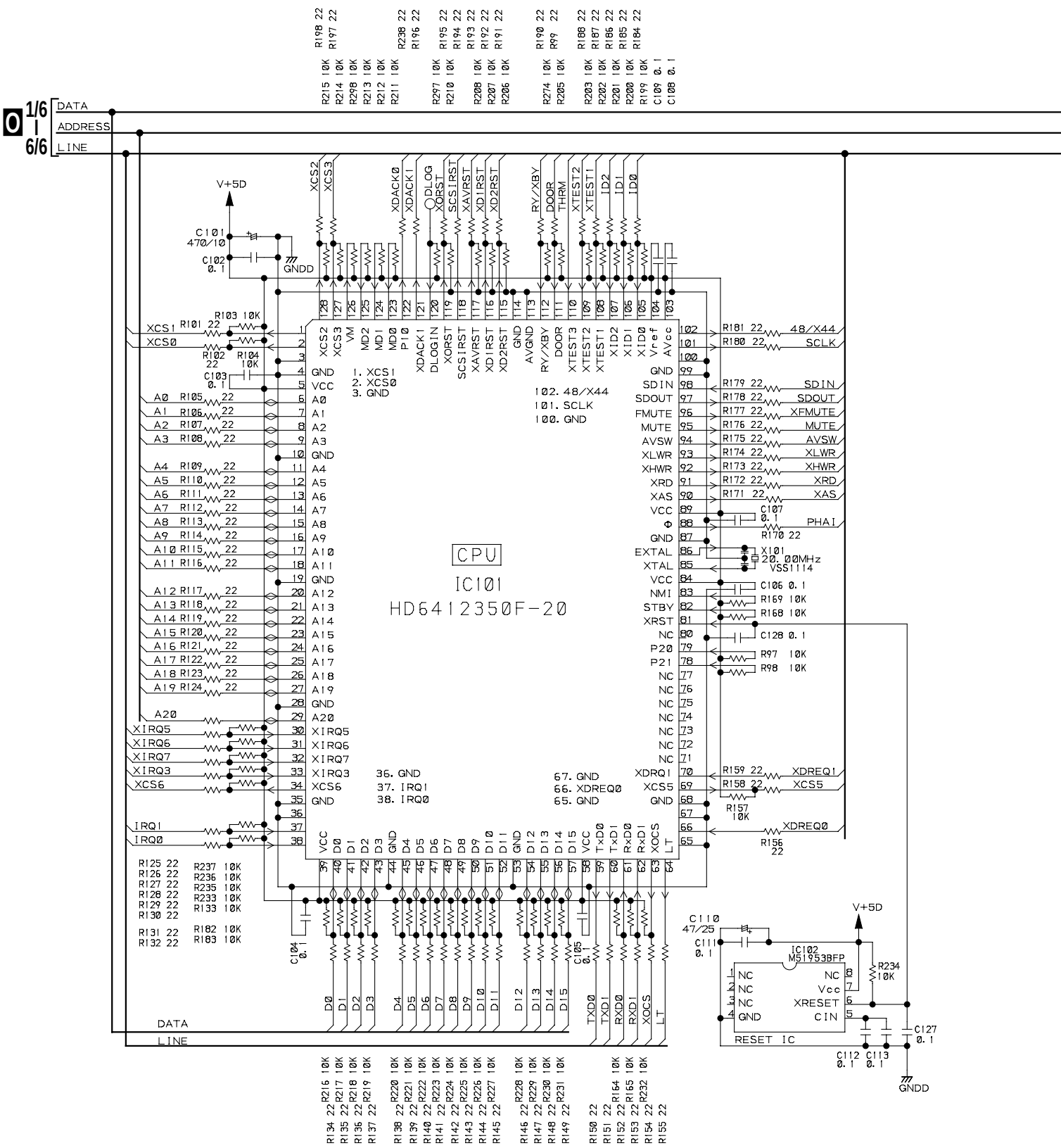


3.8 HMCB BOARD ASSY (4/4)

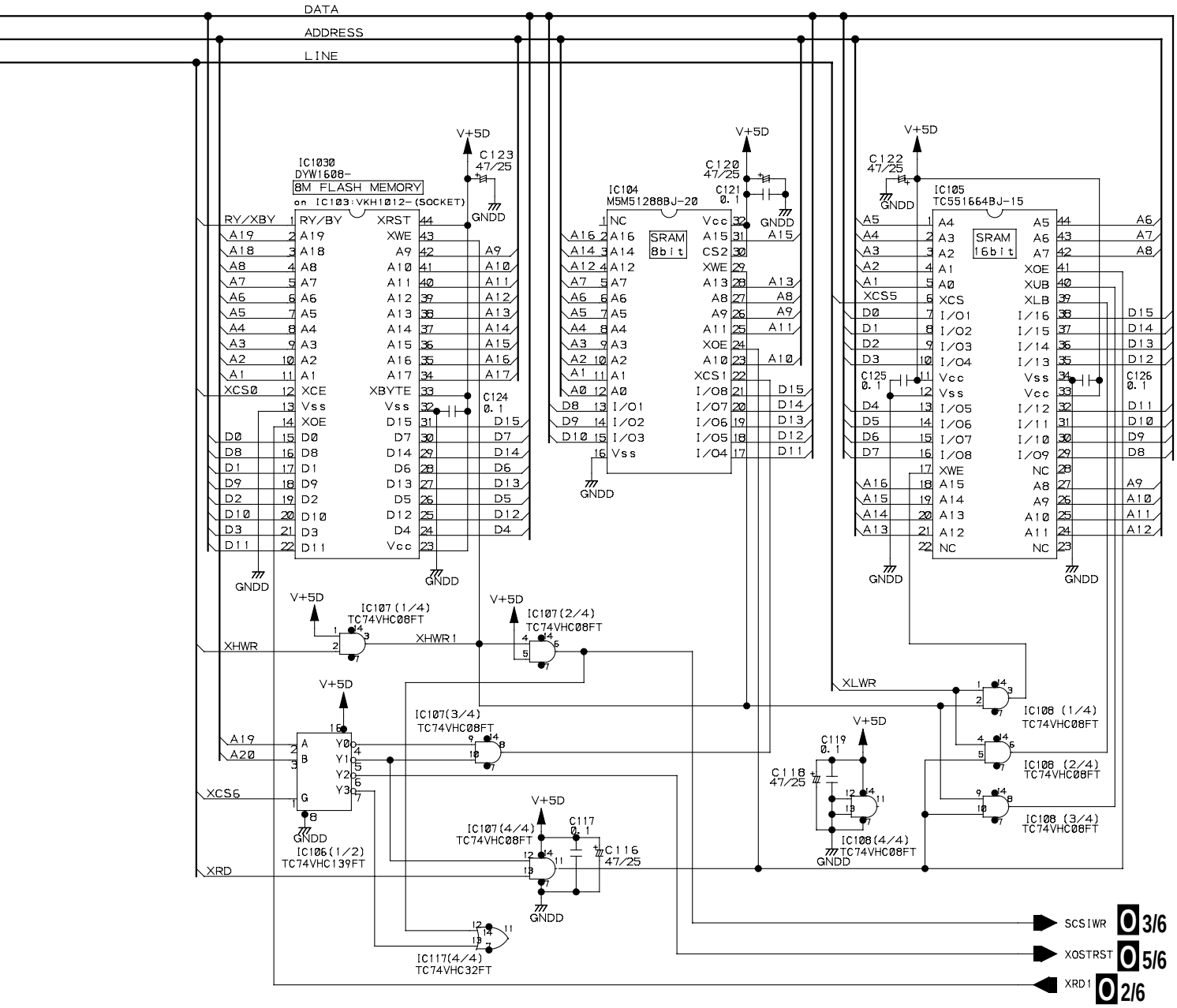



L 2/4
L 1/4
XSPST2
XSPST1
XCLMP2
XCLMP1
L 4/4 HMCB BOARD ASSY (4/4)
(DWG1501)
CN112 B8B-PH-K-Y
CL1S1
CL1S0
CLM1−
CLM1+
XCLMP1
XSPST1
XREADY1
GNDD
R 3/3
CN504
(DRIVE-1)
CN113 B8B-PH-K-R
CL2S1
CL2S0
CLM2−
CLM2+
XCLMP2
XSPST2
XREADY2
GNDD
R 3/3
CN504
(DRIVE-2)
V+12V
VREF
Q105
2PB709A
Q/R
IC110
BA6797FP
IC109
TC74HC00AF
R381 22K
MC0
MC1
L 1/4

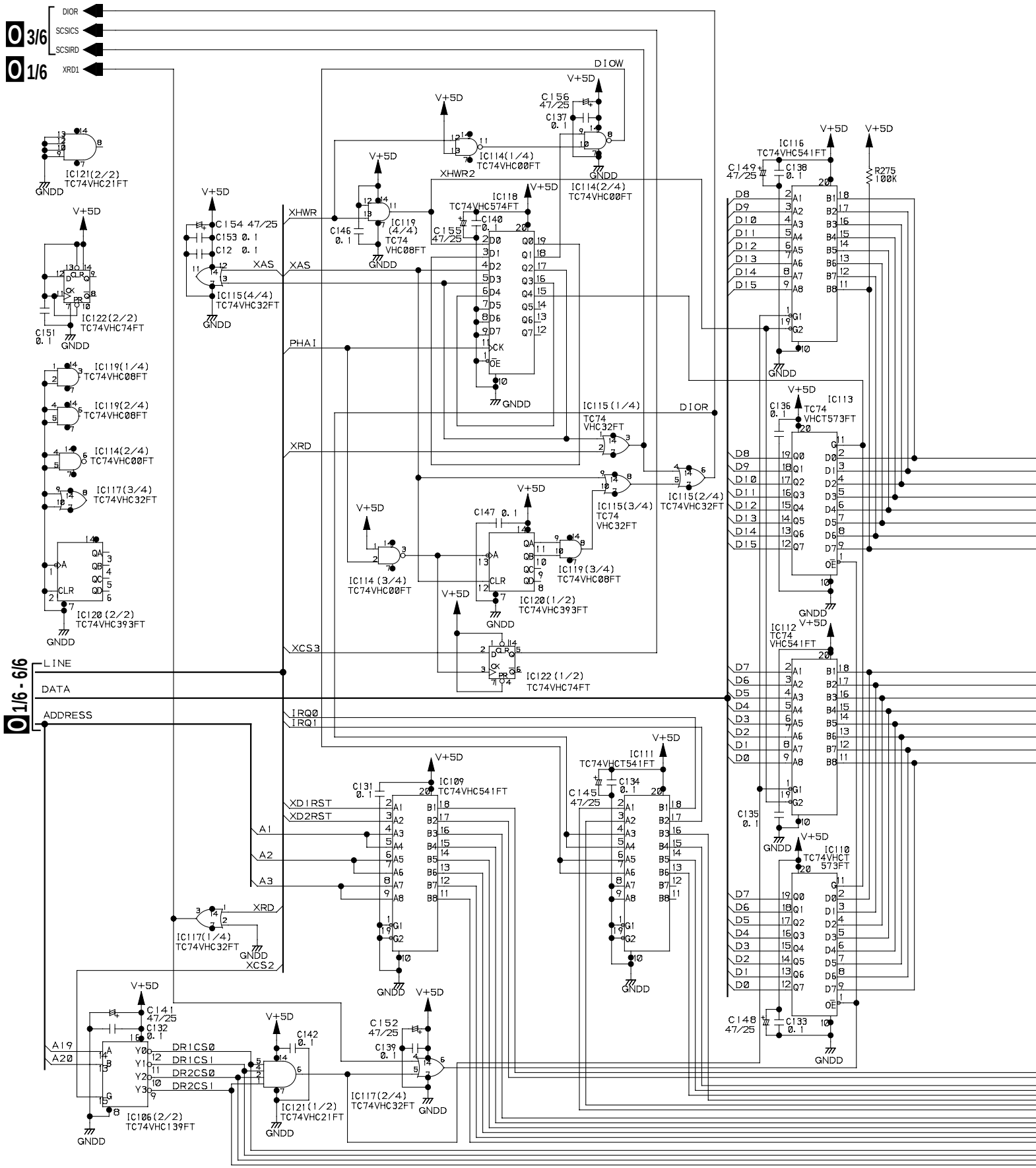
3.9 DECB BOARD ASSY (1/6)



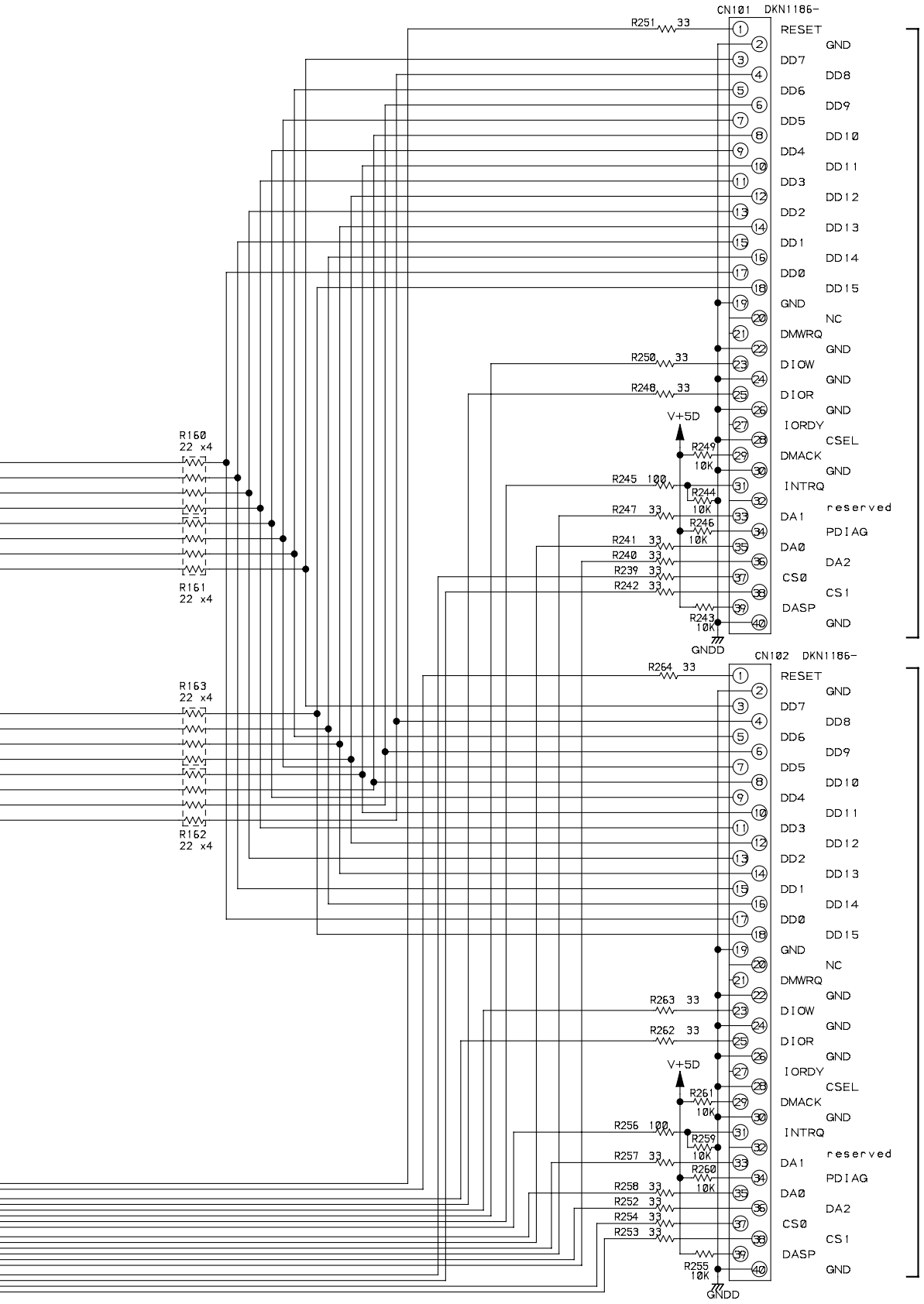
O 1/6 DECB BOARD ASSY (1/6) (DWG1500)



3.10 DECB BOARD ASSY (2/6)



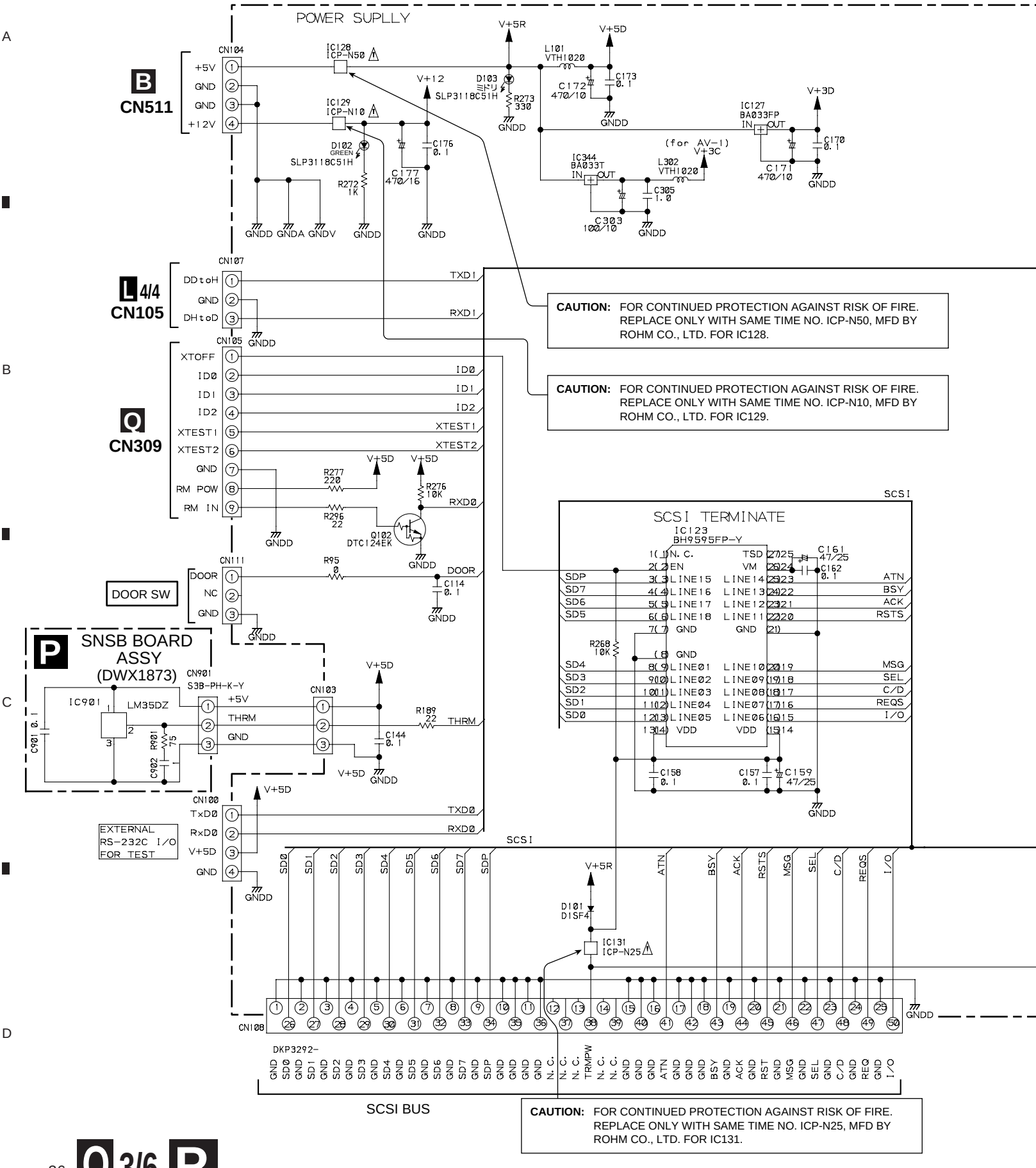
O 2/6 DECB BOARD ASSY (2/6) (DWG1500)



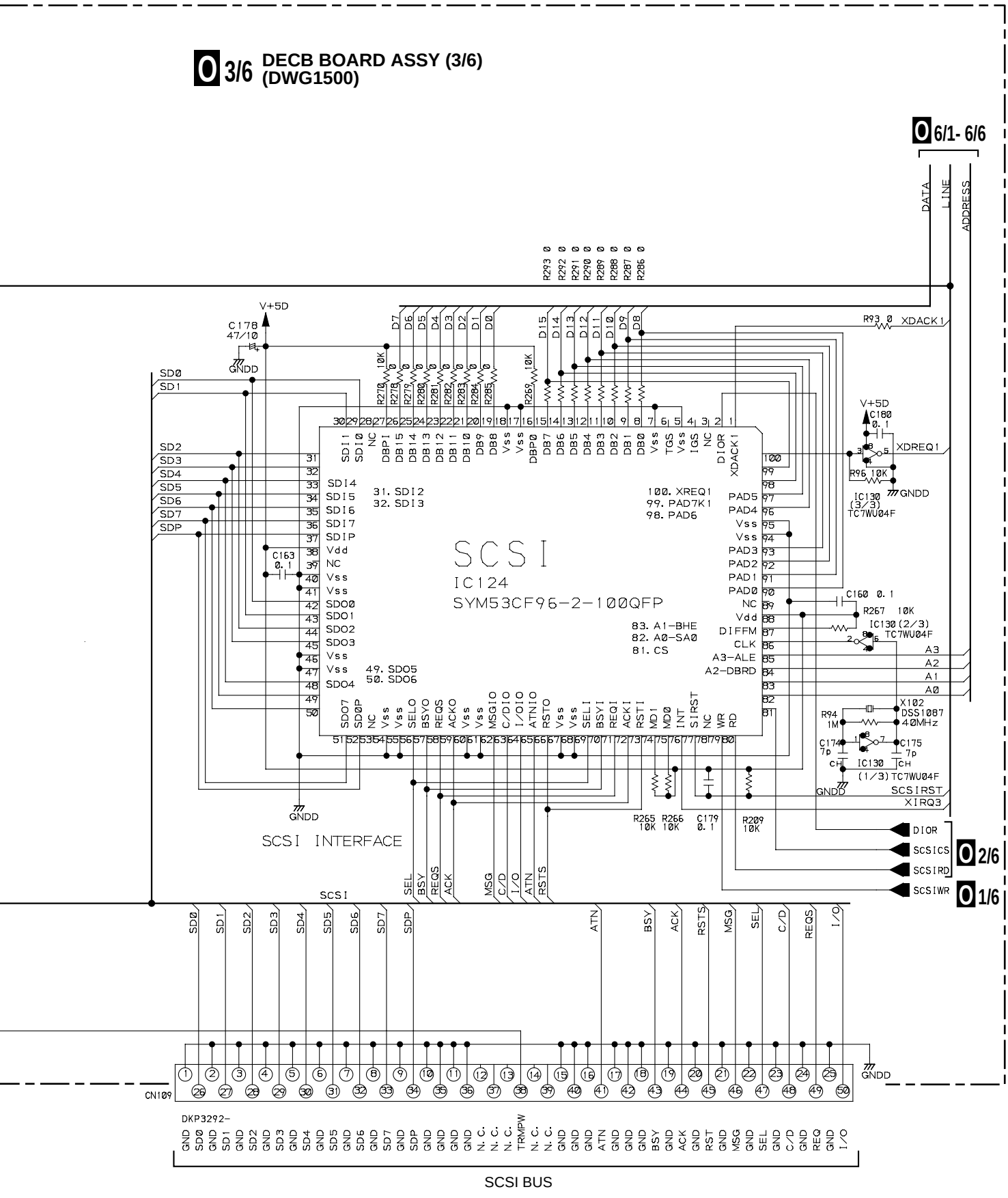
R 2/3 CN301 (DRIVE-1)

R 2/3 CN301 (DRIVE-2)

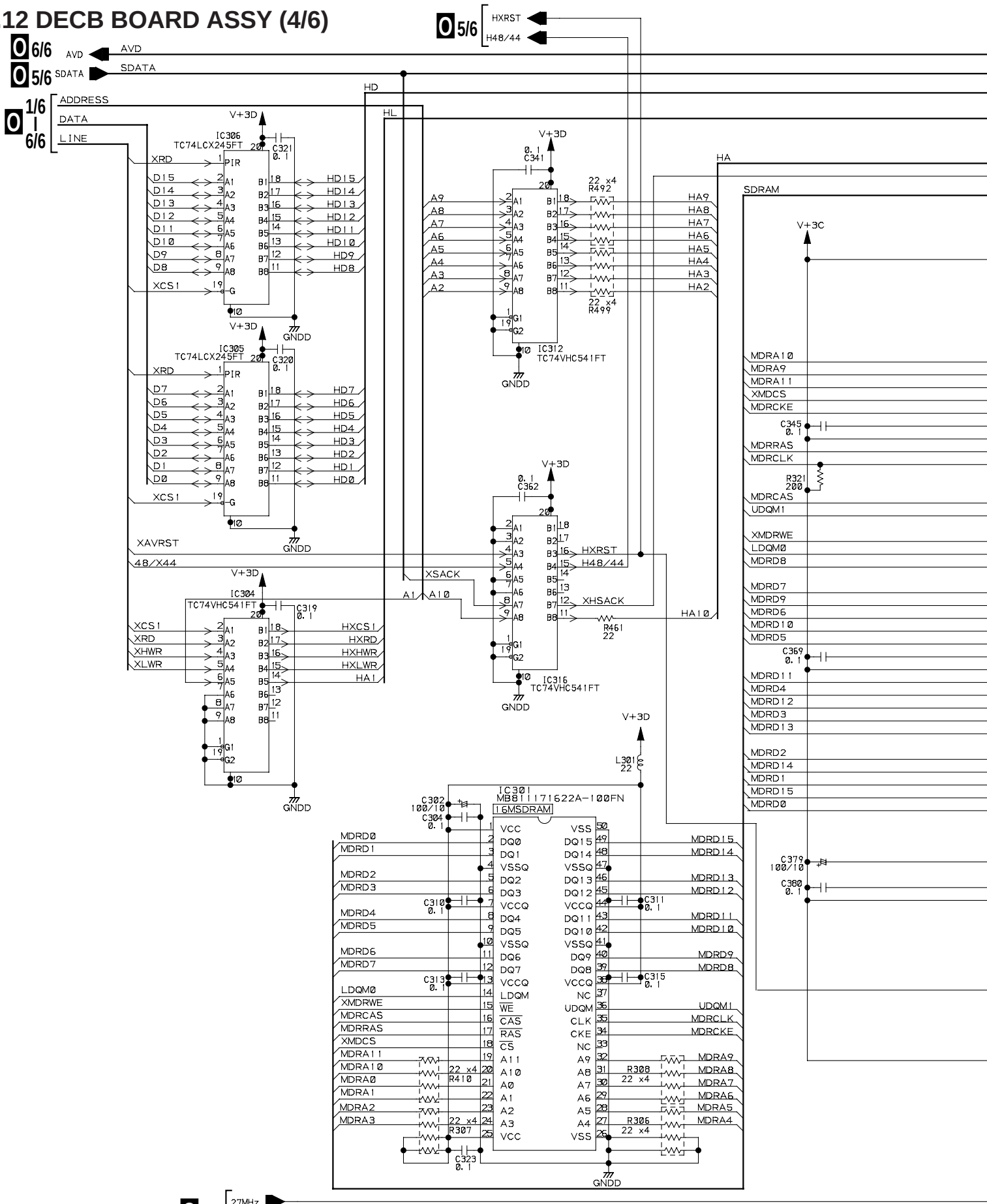
3.11 DECB (3/6) and SNSB BOARD ASSY



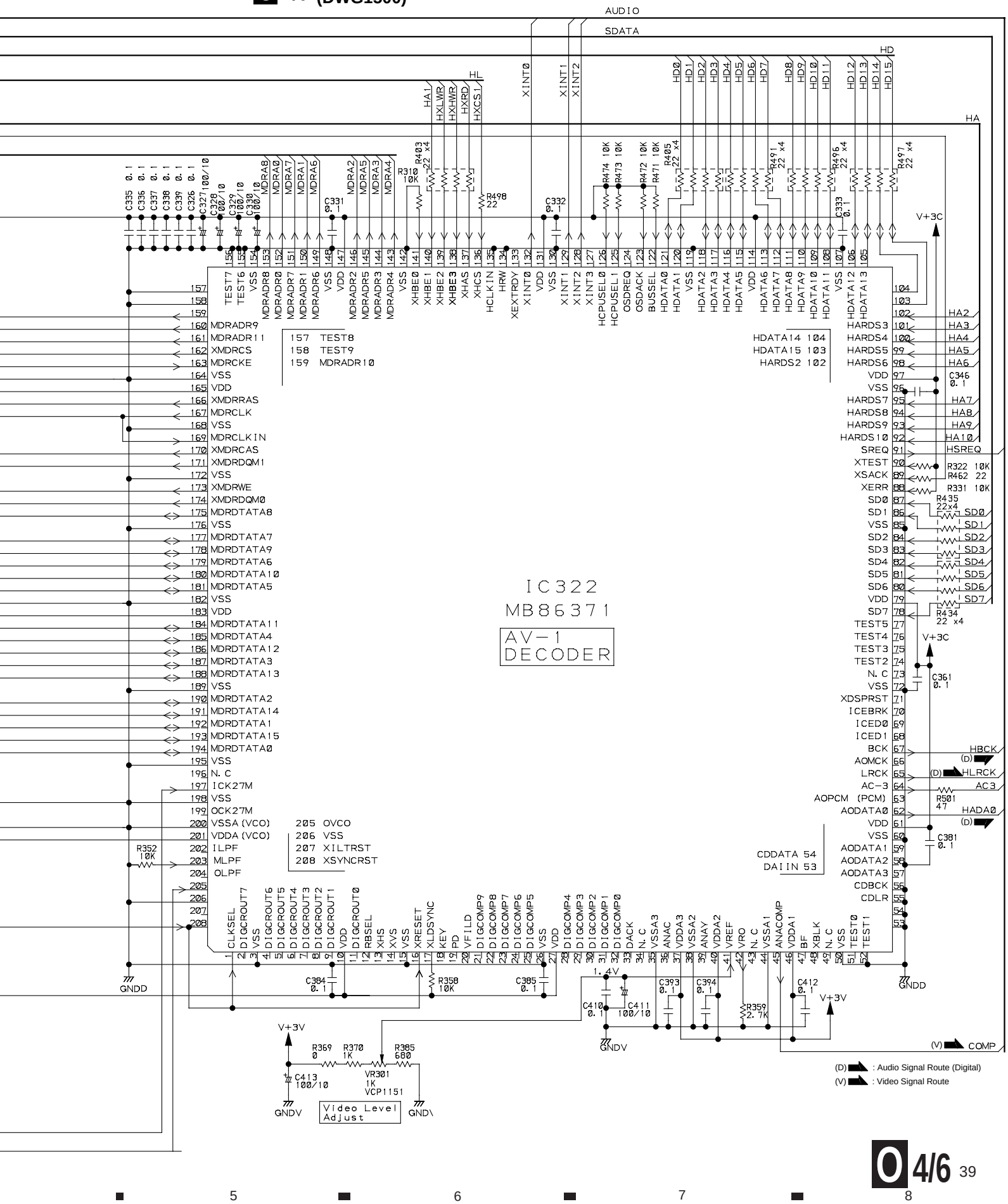
O 3/6 DECB BOARD ASSY (3/6) (DWG1500)



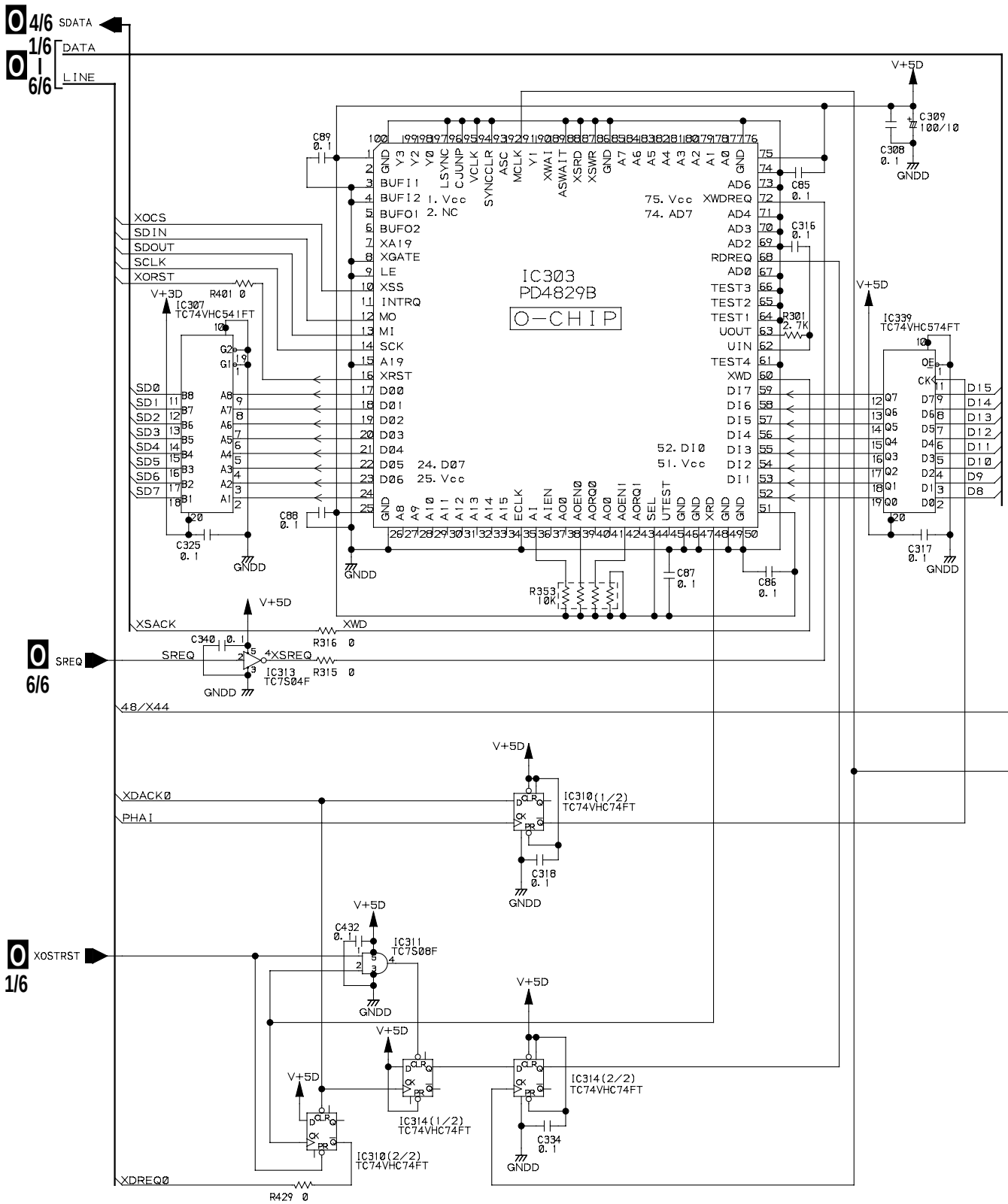
3.12 DECB BOARD ASSY (4/6)



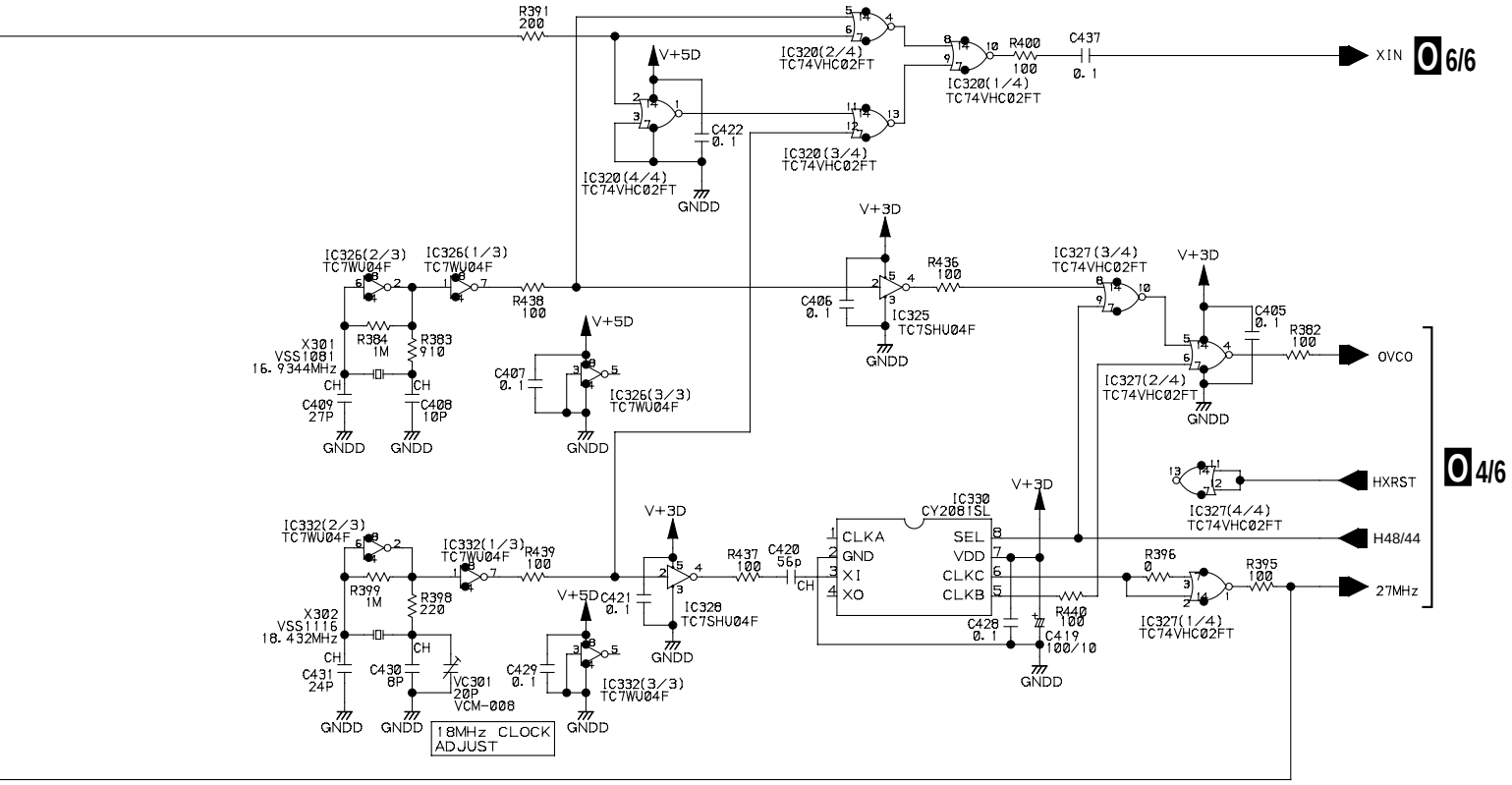
O 4/6 DECB BOARD ASSY (4/6) (DWG1500)



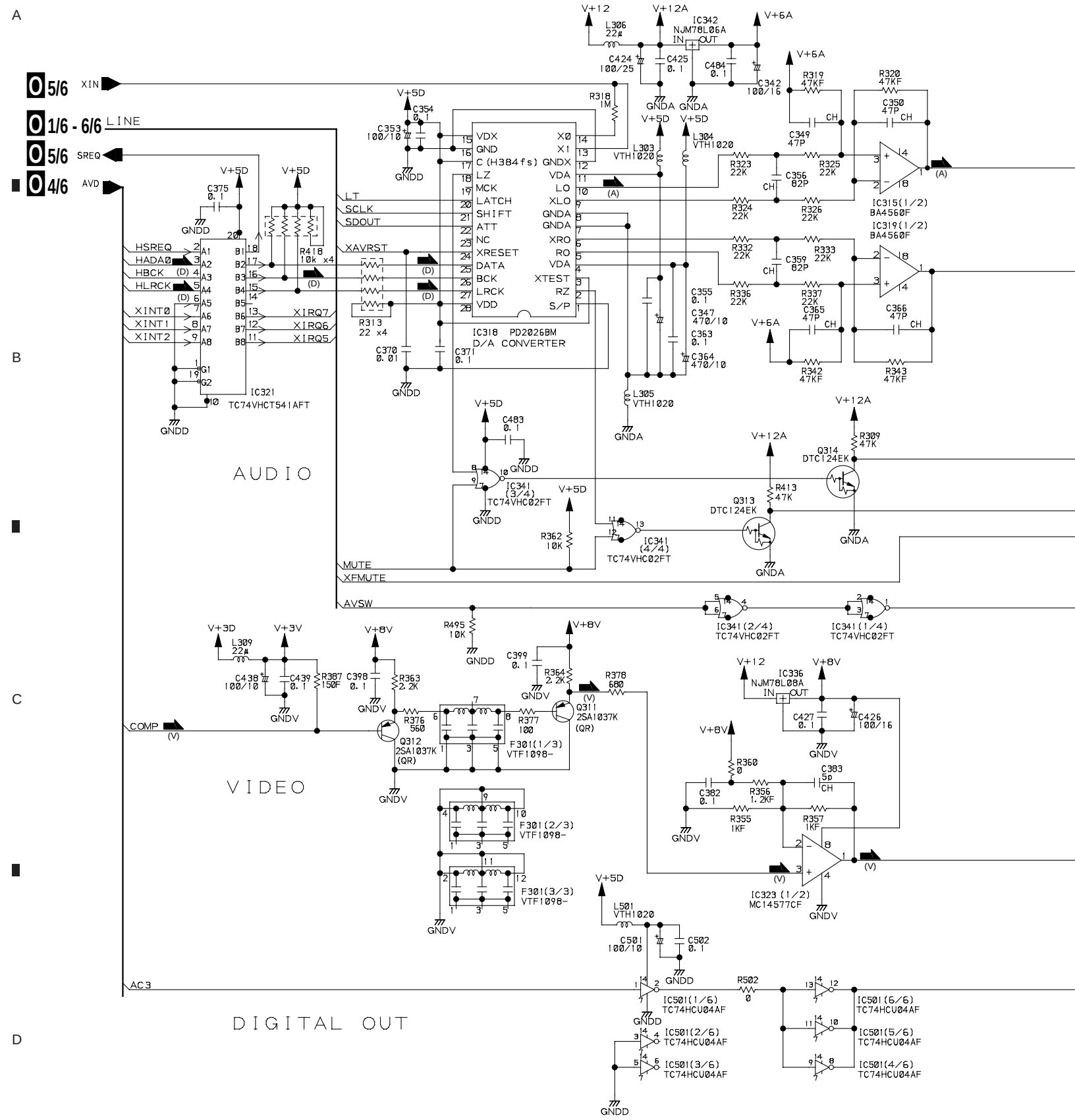
3.13 DECB BOARD ASSY (5/6)



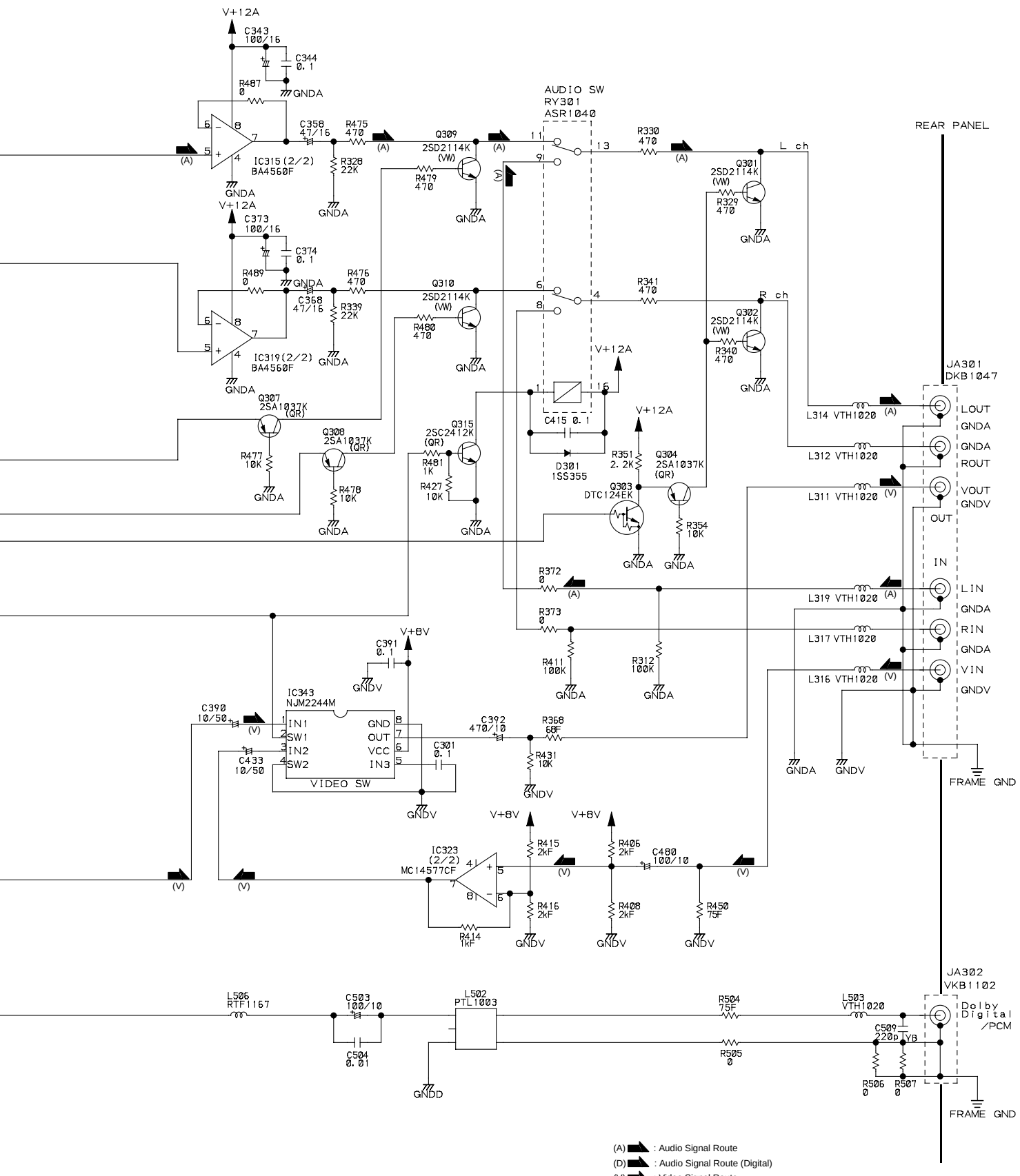
O 5/6 MAIN BOARD ASSY (5/6) (DWG1500)



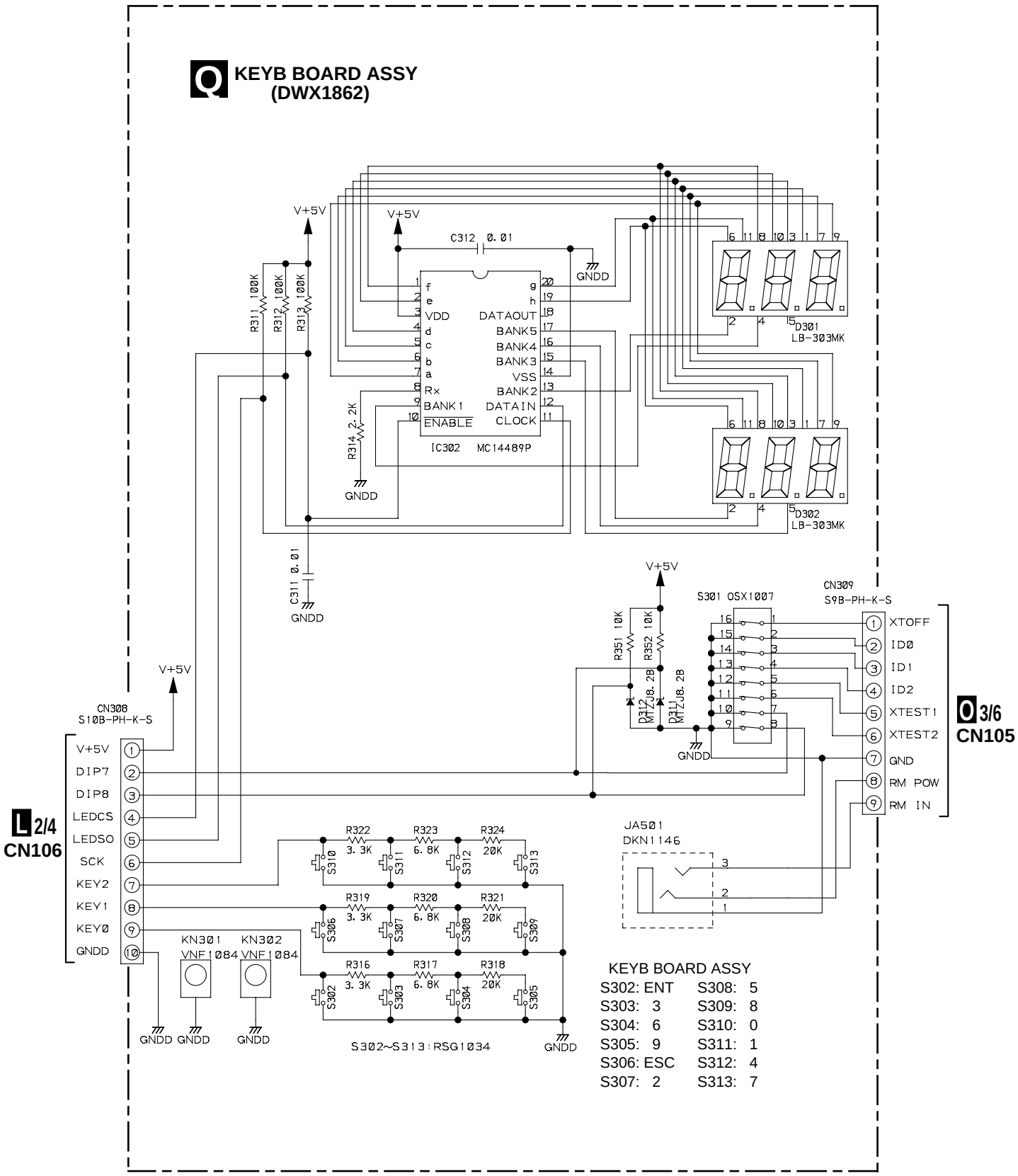
3.14 DECB BOARD ASSY (6/6)



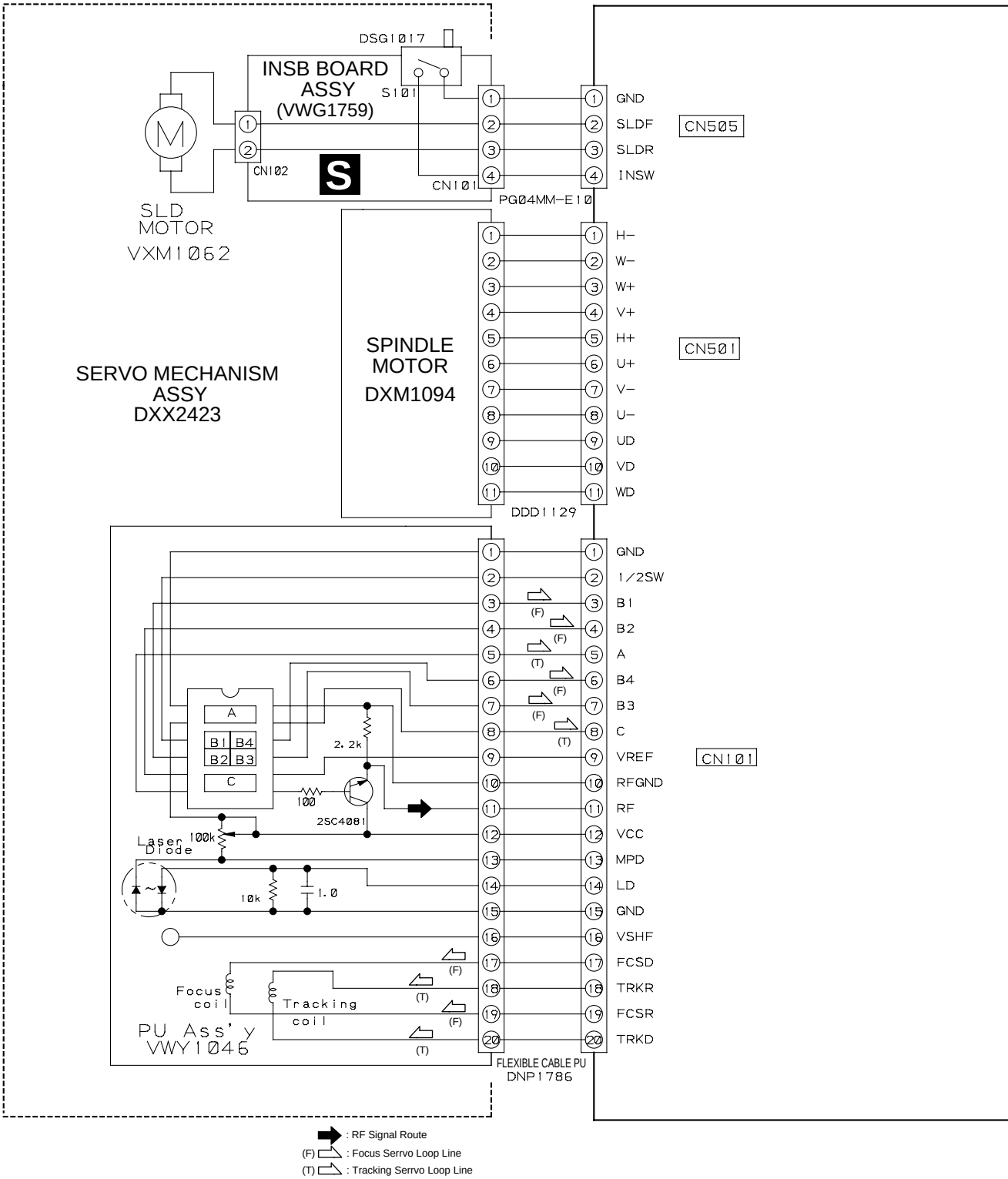
O 6/6 DECB BOARD ASSY (6/6) (DWG1500)

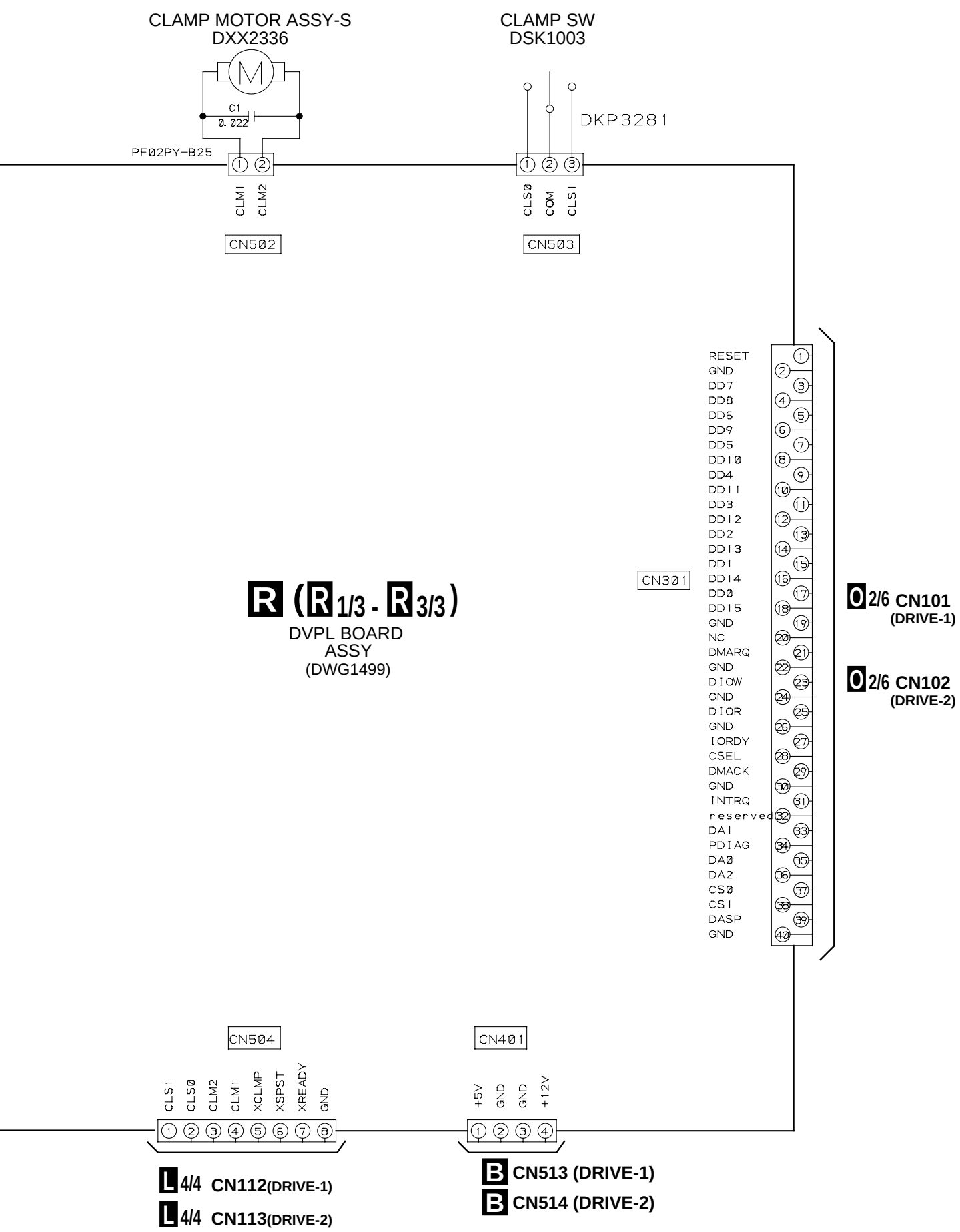


3.15 KEYB BOARD ASSY

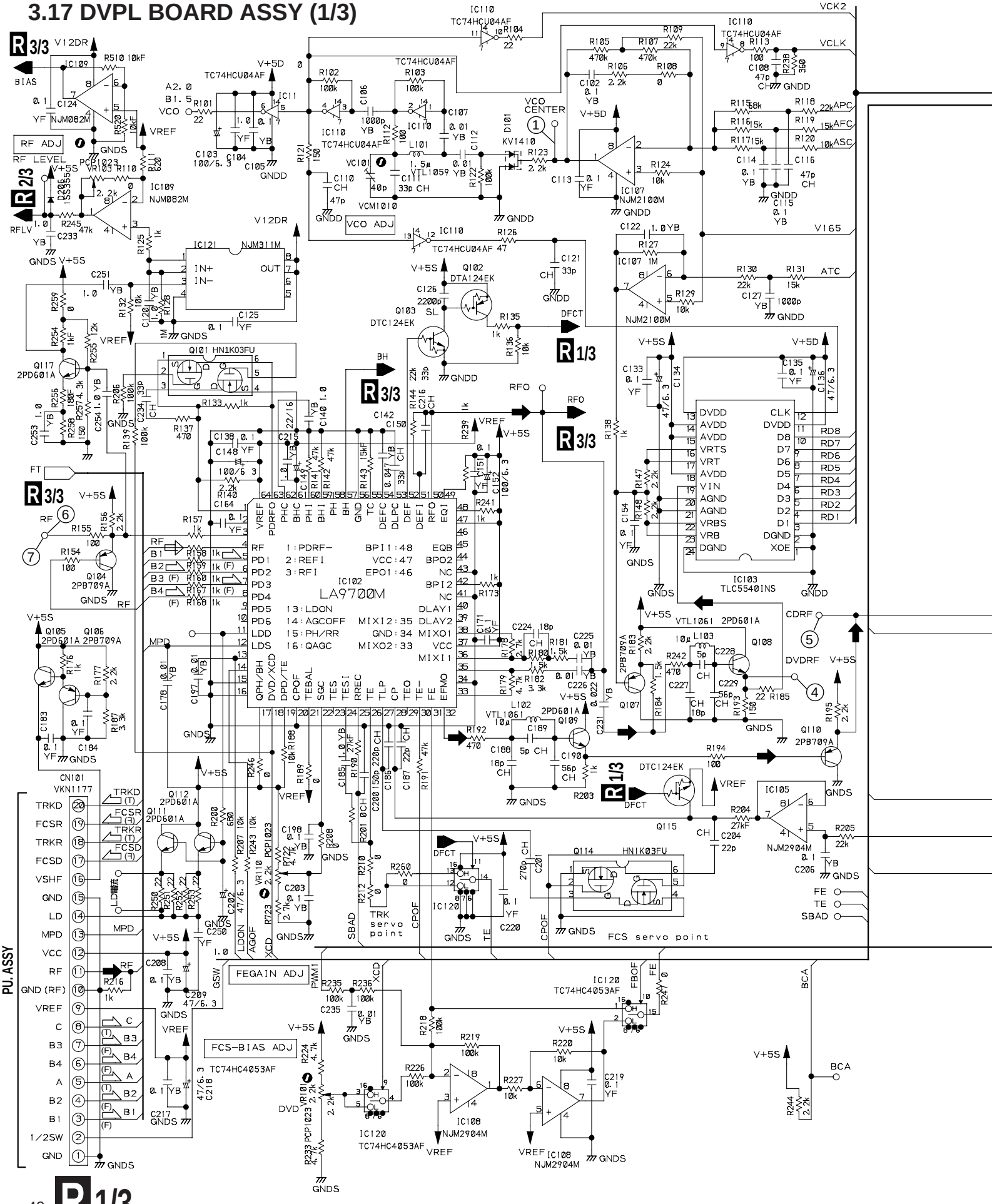


3.16 SCHEMATIC DIAGRAM (DVD PLAYER)

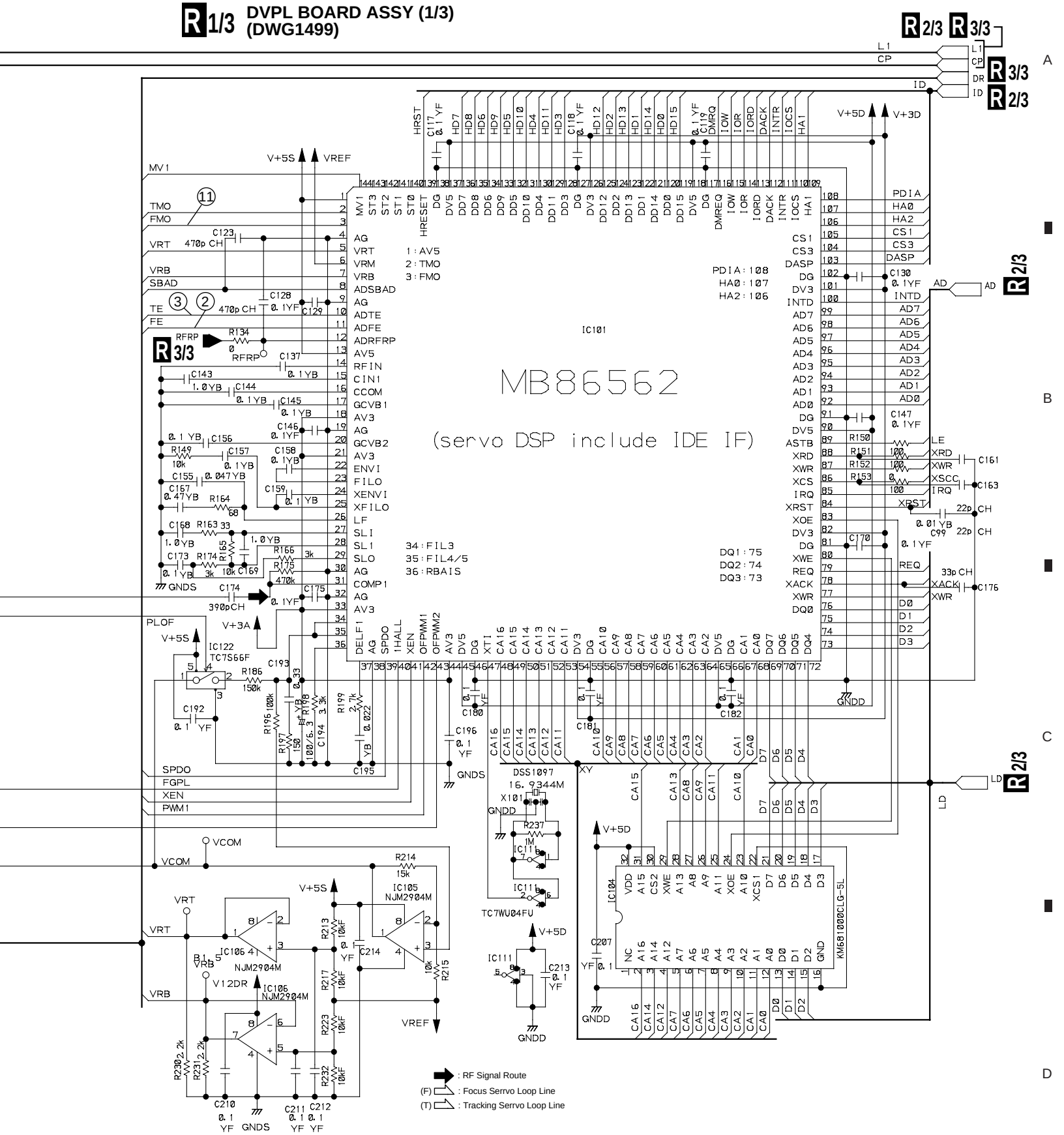



CLAMP MOTOR ASSY-S
DXX2336
C1
0.022
PF02PY-B25
CLM1
CLM2
CN502
CLAMP SW
DSK1003
DKP3281
CLS0
COM
CLS1
CN503
CN301
RESET
GND
DD7
DD8
DD6
DD9
DD5
DD10
DD4
DD11
DD3
DD12
DD2
DD13
DD1
DD14
DD0
DD15
GND
NC
DMARQ
GND
DIOW
GND
DIOR
GND
IORDY
CSEL
DMACK
GND
INTRQ
reserved
DA1
PDIAG
DA0
DA2
CS0
CS1
DASP
GND
2/6 CN101
(DRIVE-1)
2/6 CN102
(DRIVE-2)
R (R1/3 - R3/3)
DVPL BOARD
ASSY
(DWG1499)
CN504
CLS1
CLS0
CLM2
CLM1
XCLMP
XSPST
XREADY
GND
CN401
+5V
GND
GND
+12V
4/4 CN112(DRIVE-1)
4/4 CN113(DRIVE-2)
CN513 (DRIVE-1)
CN514 (DRIVE-2)

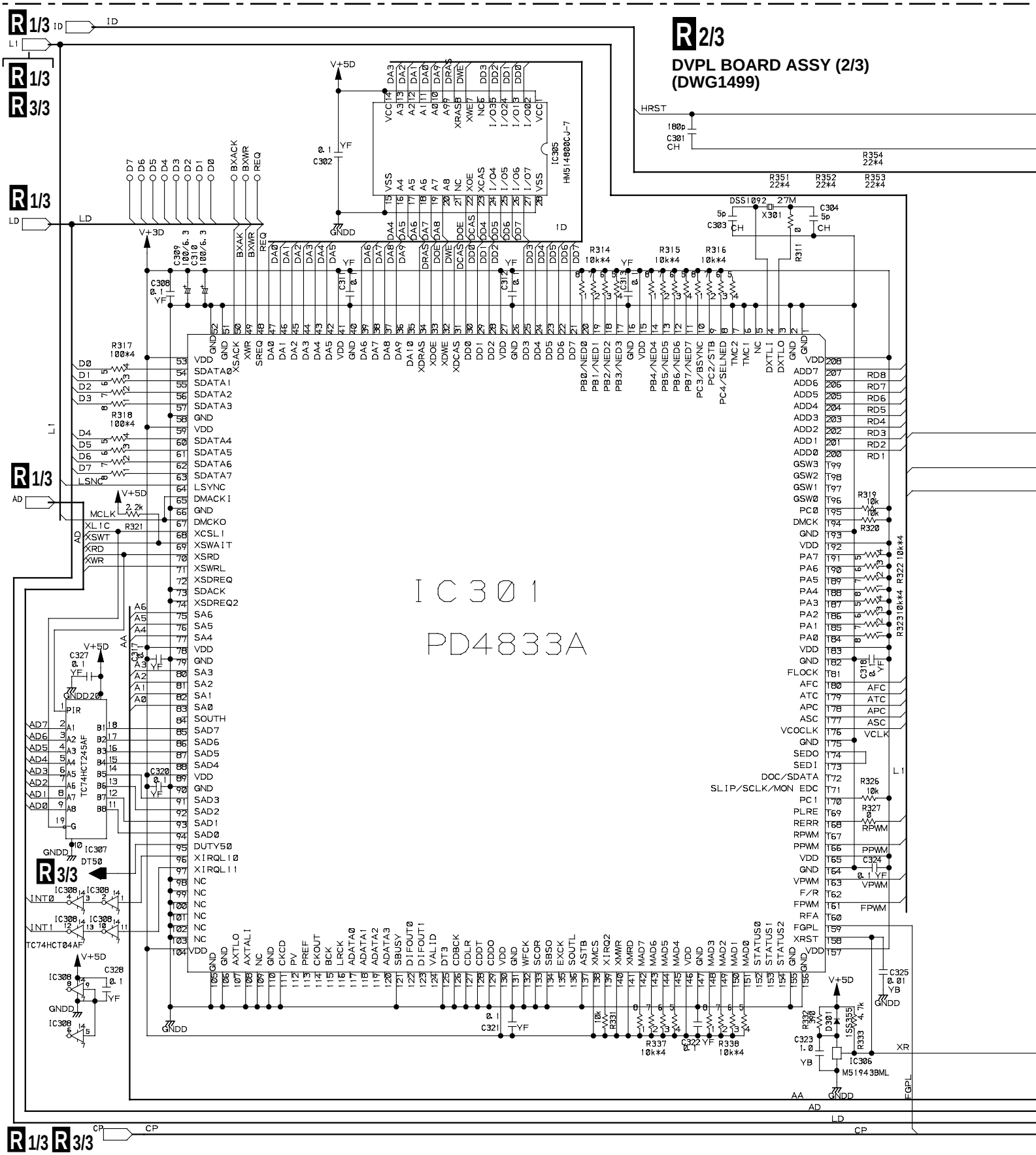
3.17 DVPL BOARD ASSY (1/3)



R 1/3 DVPL BOARD ASSY (1/3) (DWG1499)

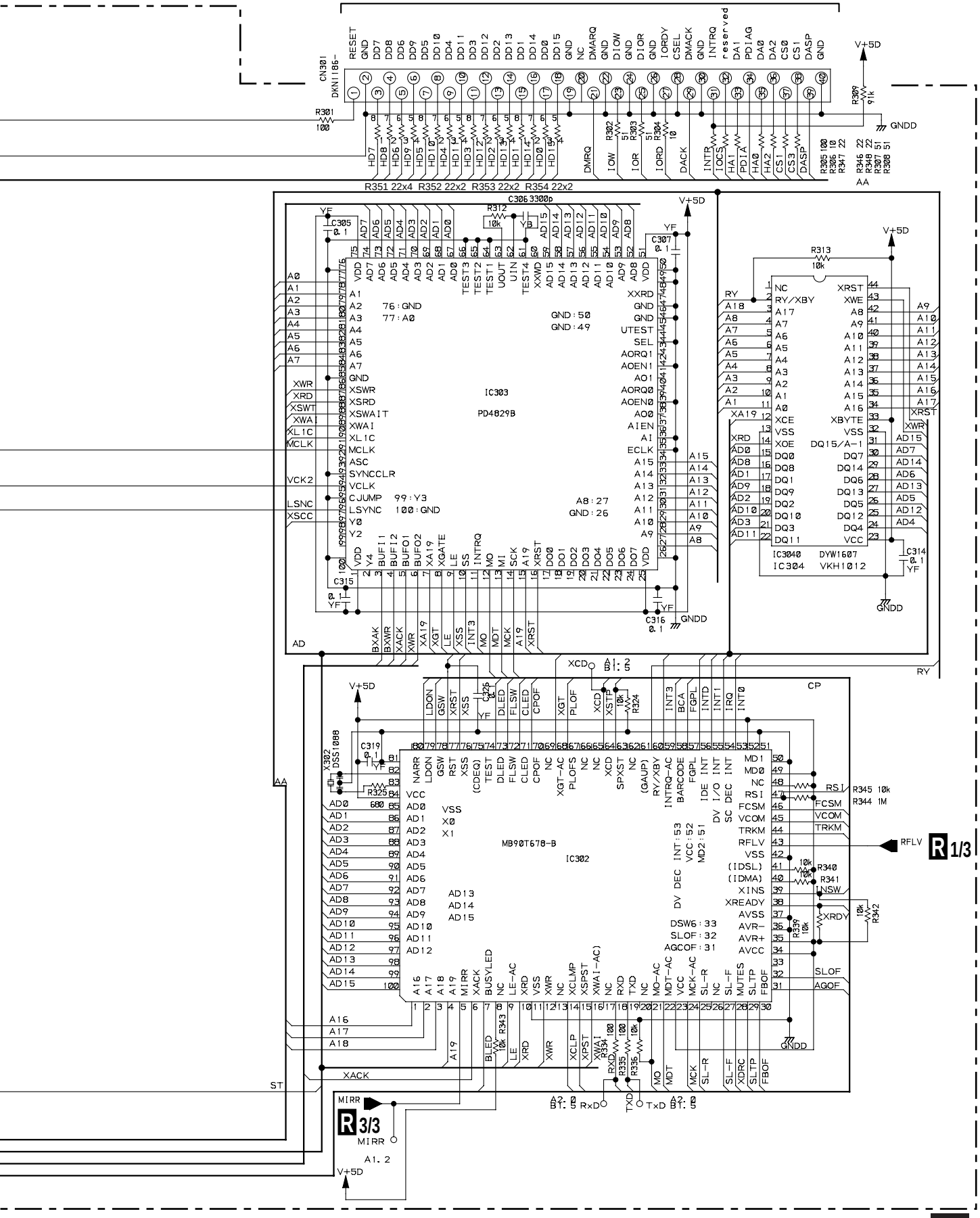


3.18 DVPL BOARD ASSY (2/3)

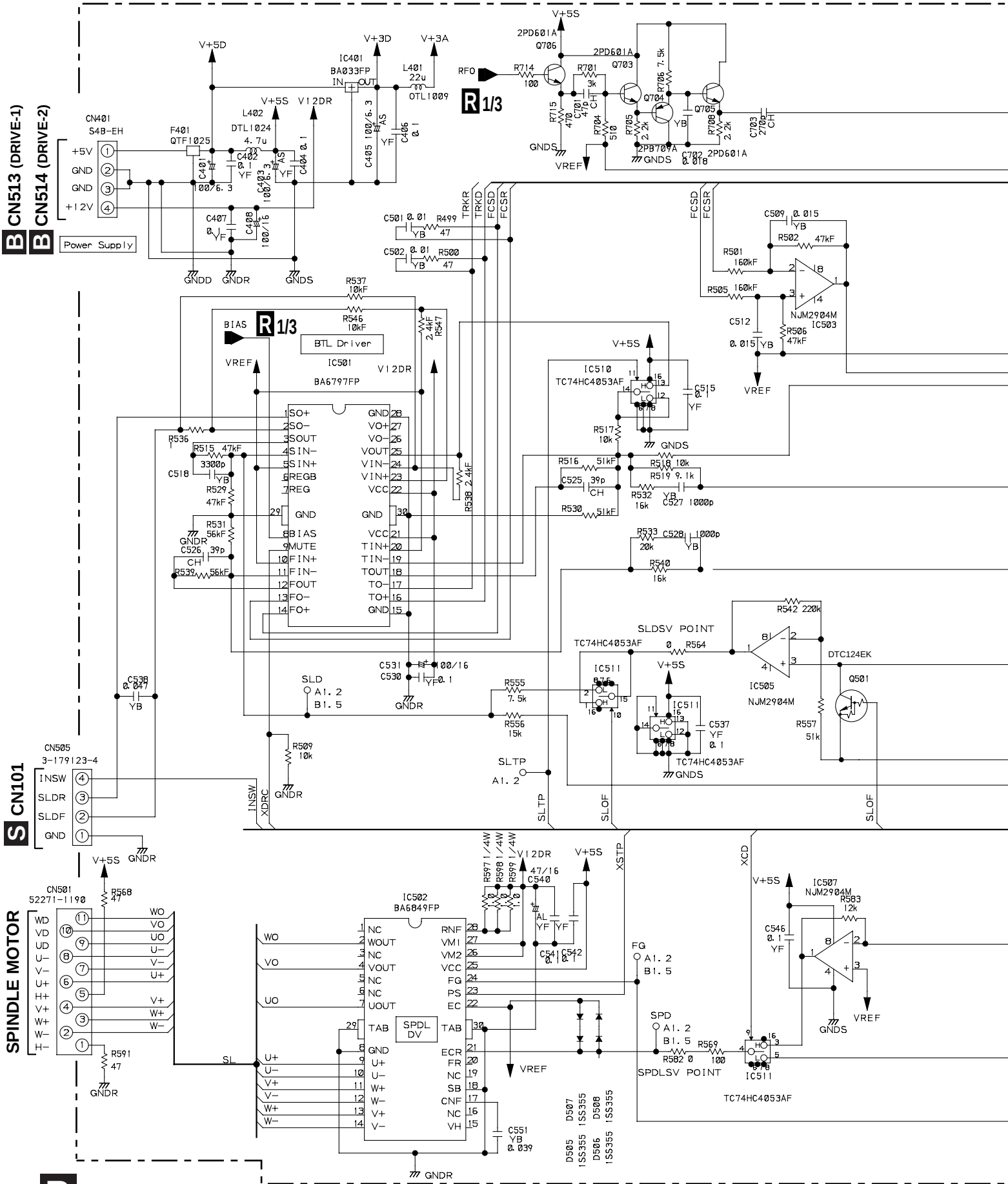


O 2/6 CN101 (DRIVE-1)

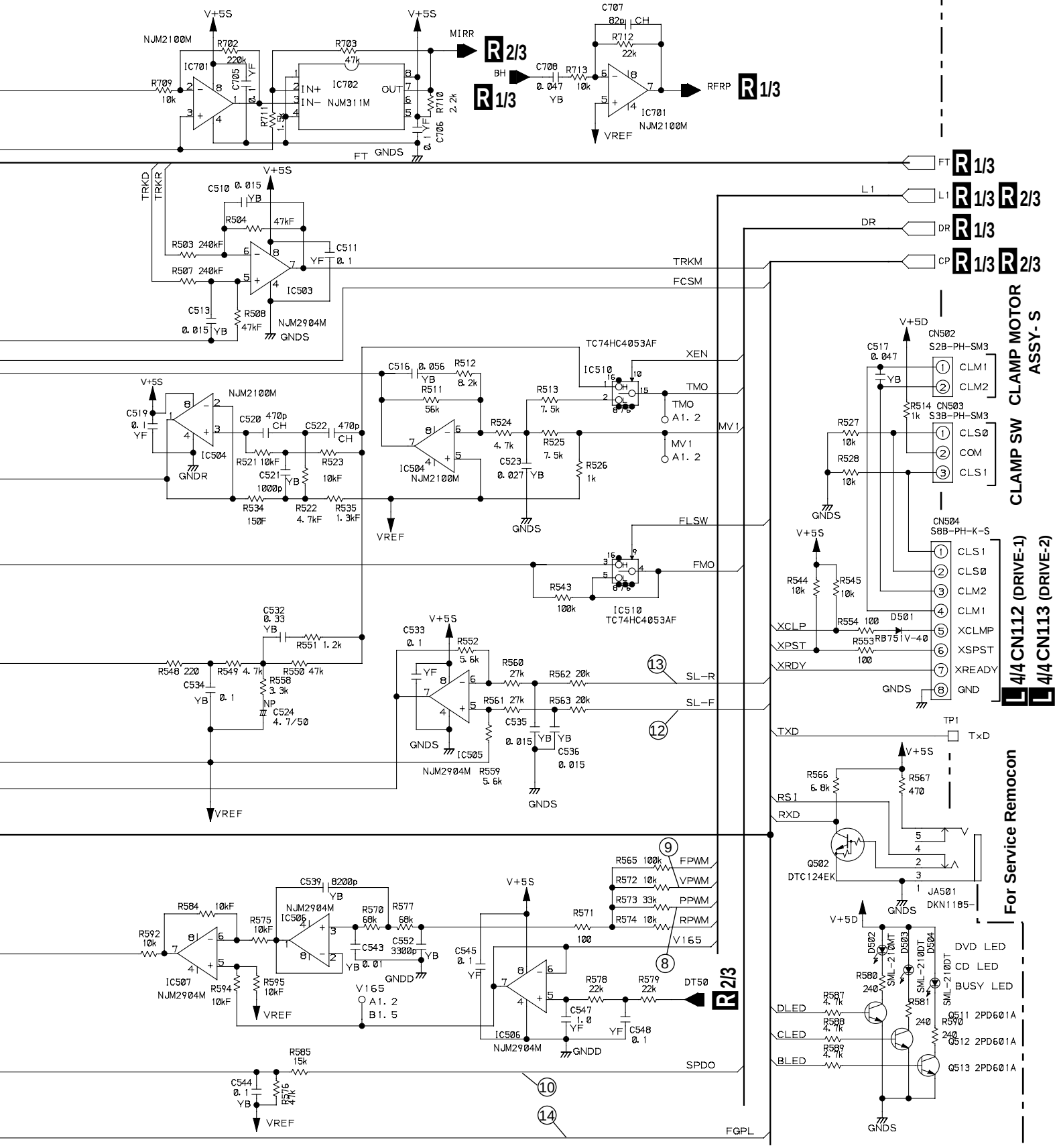
O 2/6 CN102 (DRIVE-2)



3.19 DVPL BOARD ASSY (3/3)



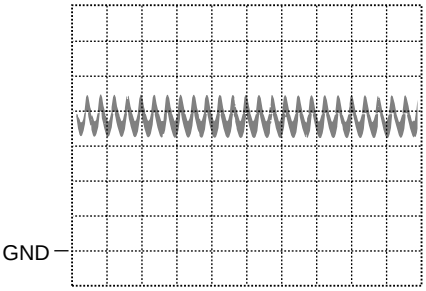
R 3/3 DVPL BOARD ASSY (3/3) (DWG1499)



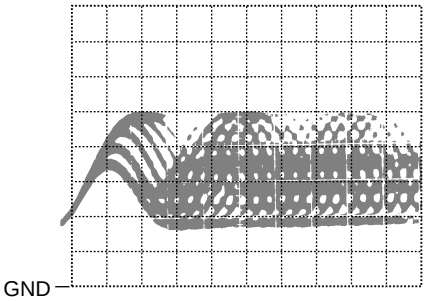
Waveforms (1/2) of DVPL BOARD ASSY

Note: The encircled numbers denote measuring point in the schematic diagram. ∗1 MODE: Focus UP/DOWN MODE

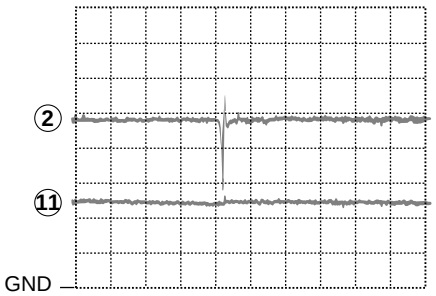
1 IC107-Pin 1: PLAY MODE
500mV/div 100nsec/div



4 DVD RF: PLAY MODE
500mV/div 100nsec/div

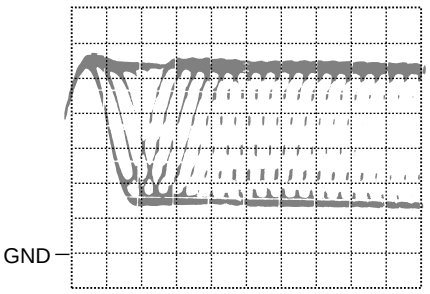


2 IC101-Pin11(ADFE): FOCUS-IN MODE
500 mV/div 10 msec/div (DVD-S)
11 IC101-Pin3(FMO): FOCUS-IN MODE
1V/div 10msec/div

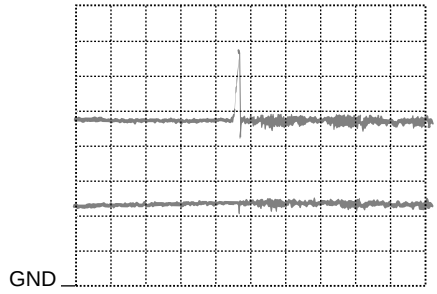


2 IC101-Pin11(ADFE): ∗1 MODE
500 mV/div 10 msec/div (DVD-S)
11 IC101-Pin3(FMO): ∗1 MODE
1V/div 10msec/div

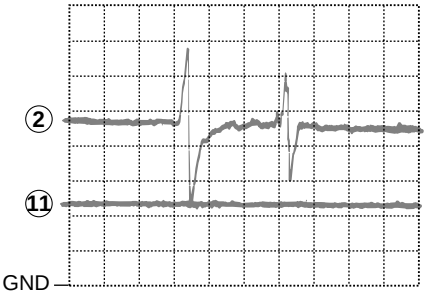
5 CD RF: PLAY MODE
500mV/div 100nsec/div



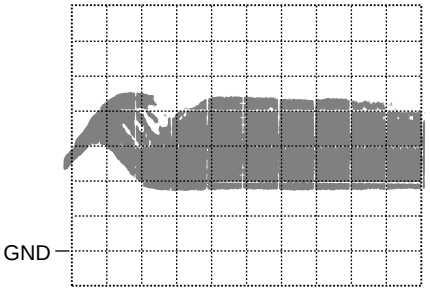
2 IC101-Pin11(ADFE): FOCUS-IN MODE
500 mV/div 10 msec/div (CD)
11 IC101-Pin3(FMO): FOCUS-IN MODE
1V/div 10msec/div



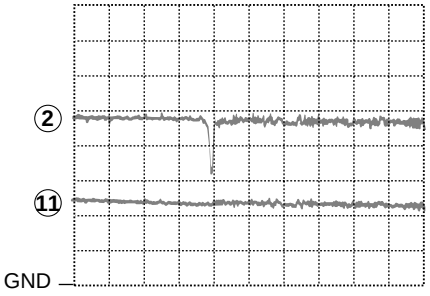
2 IC101-Pin11(ADFE): ∗1 MODE
500 mV/div 10 msec/div (CD)
11 IC101-Pin3(FMO): ∗1 MODE
1V/div 10msec/div



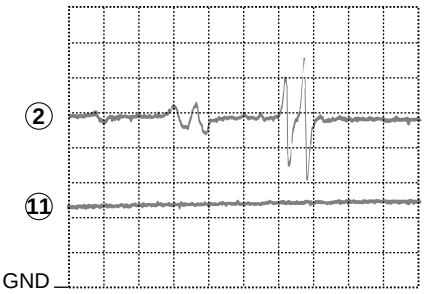
6 RF : PLAY MODE (DVD)
100mV/div 100nsec/div



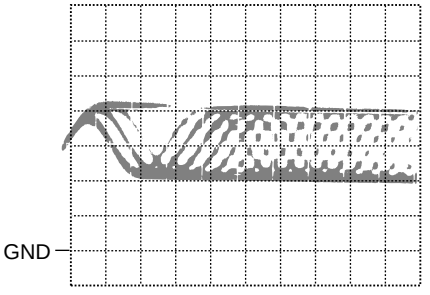
2 IC101-Pin11(ADFE): FOCUS-IN MODE
500 mV/div 10 msec/div (DVD-D)
11 IC101-Pin3(FMO): FOCUS-IN MODE
1V/div 10msec/div



2 IC101-Pin11(ADFE): ∗1 MODE
500 mV/div 10 msec/div (DVD-D)
11 IC101-Pin3(FMO): ∗1 MODE
1V/div 10msec/div



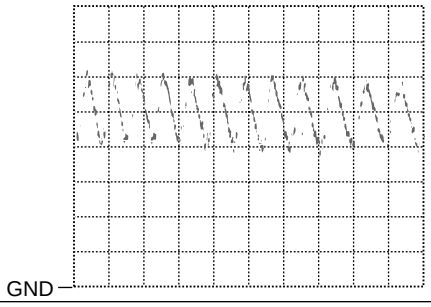
7 RF : PLAY MODE (CD)
100mV/div 100nsec/div



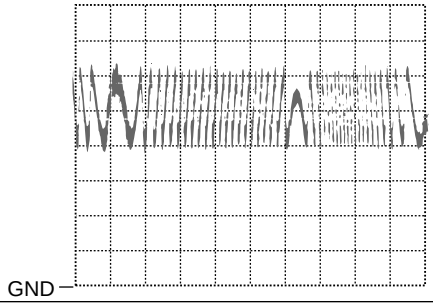
Waveforms (2/2) of DVPL BOARD ASSY

Note: The encircled numbers denote measuring point in the schematic diagram.

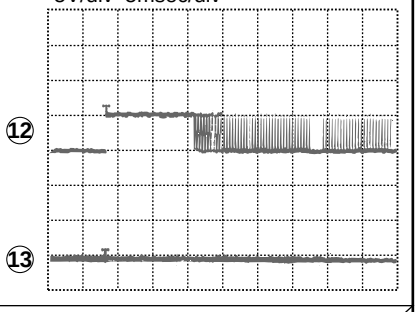
③ IC101-Pin 10: 44TM,13TM,14TM MODE (ADTE)
500mV/div 500µsec/div



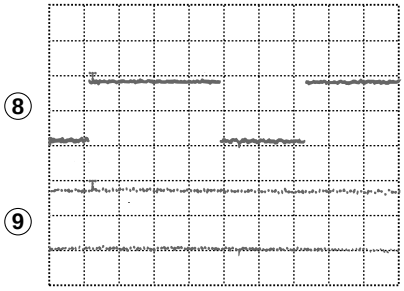
③ IC101-Pin 10: 44TM,13TM,14TM MODE (ADTE)
500mV/div 5msec/div



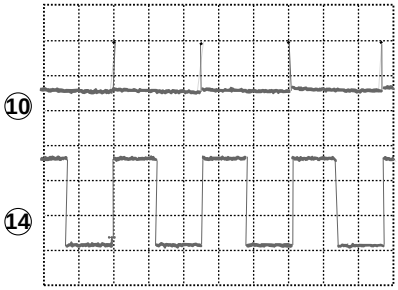
⑫ SL-F: SEARCH MODE
5V/div 5msec/div
⑬ SL-R: SEARCH MODE
5V/div 5msec/div



⑧ PPWM: PLAY MODE
2V/div 100µsec/div
⑨ VPWM: PLAY MODE
2V/div 100µsec/div



⑩ SPDO: PLAY MODE (CD)
2V/div 2msec/div
⑭ FGPL : PLAY MODE (CD)
2V/div 2msec/div



4.PCB CONNECTION DIAGRAM

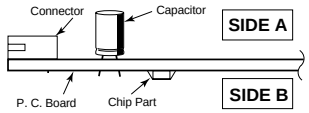
4.1 PWRS, PWRP, INDB, PSWB and ILMB BOARD ASSY

NOTE FOR PCB DIAGRAMS:

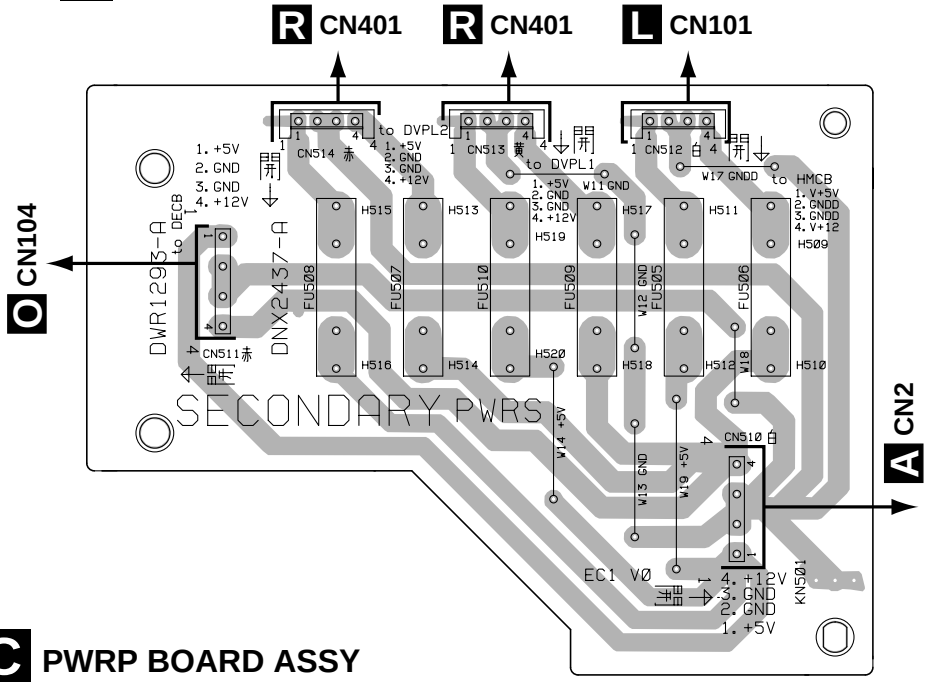
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E	Transistor
B C E	B C E	Transistor with resistor
D G S	D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
4. Viewpoint of PCB diagrams

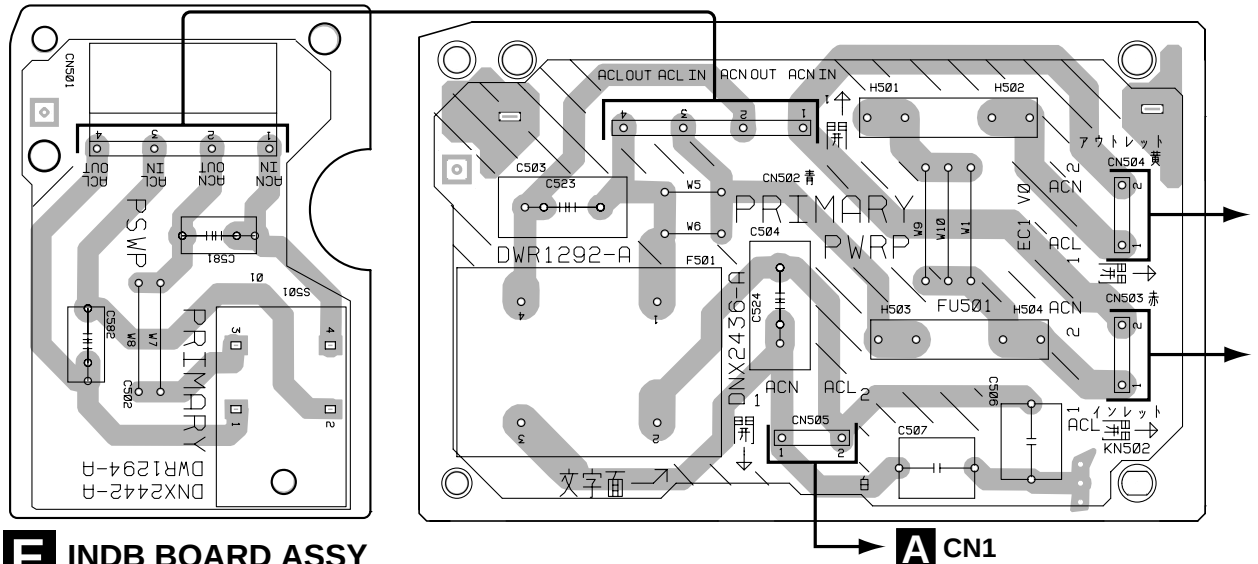


B PWRS BOARD ASSY

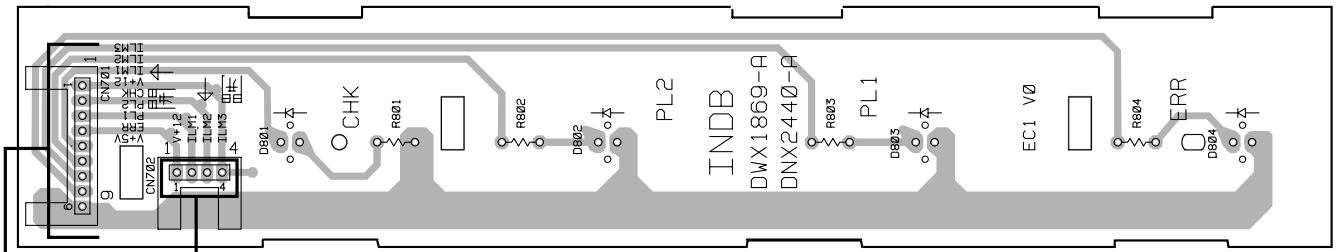


D PSWB BOARD ASSY

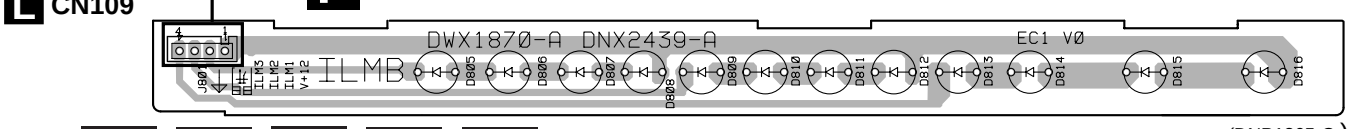
C PWRP BOARD ASSY



E INDB BOARD ASSY

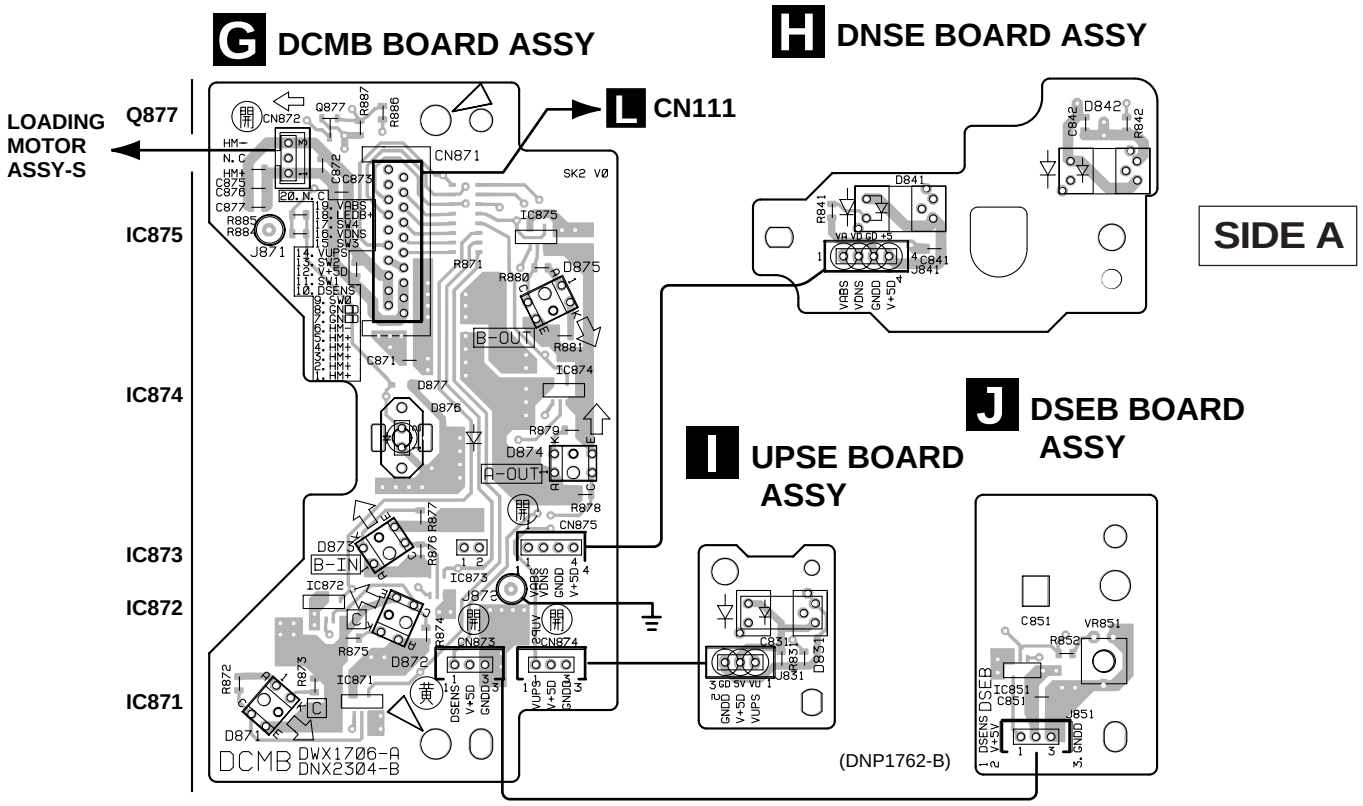


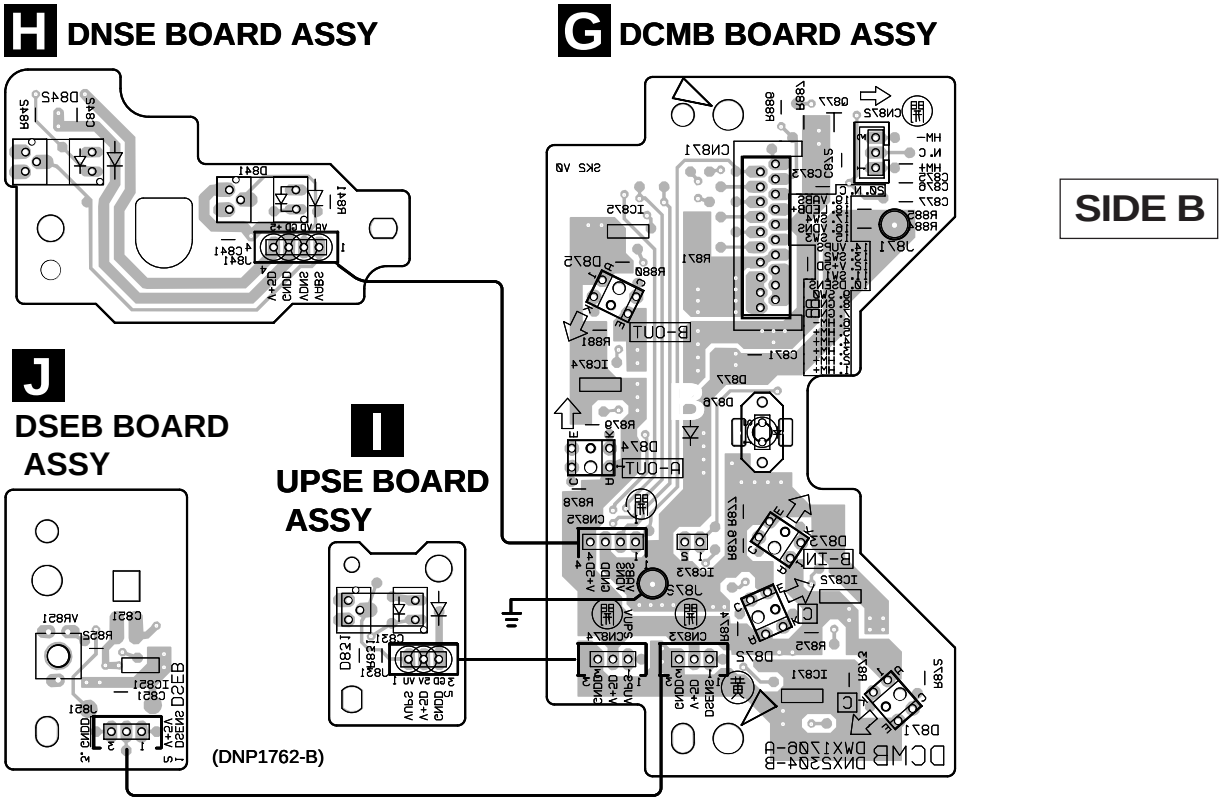
F ILMB BOARD ASSY



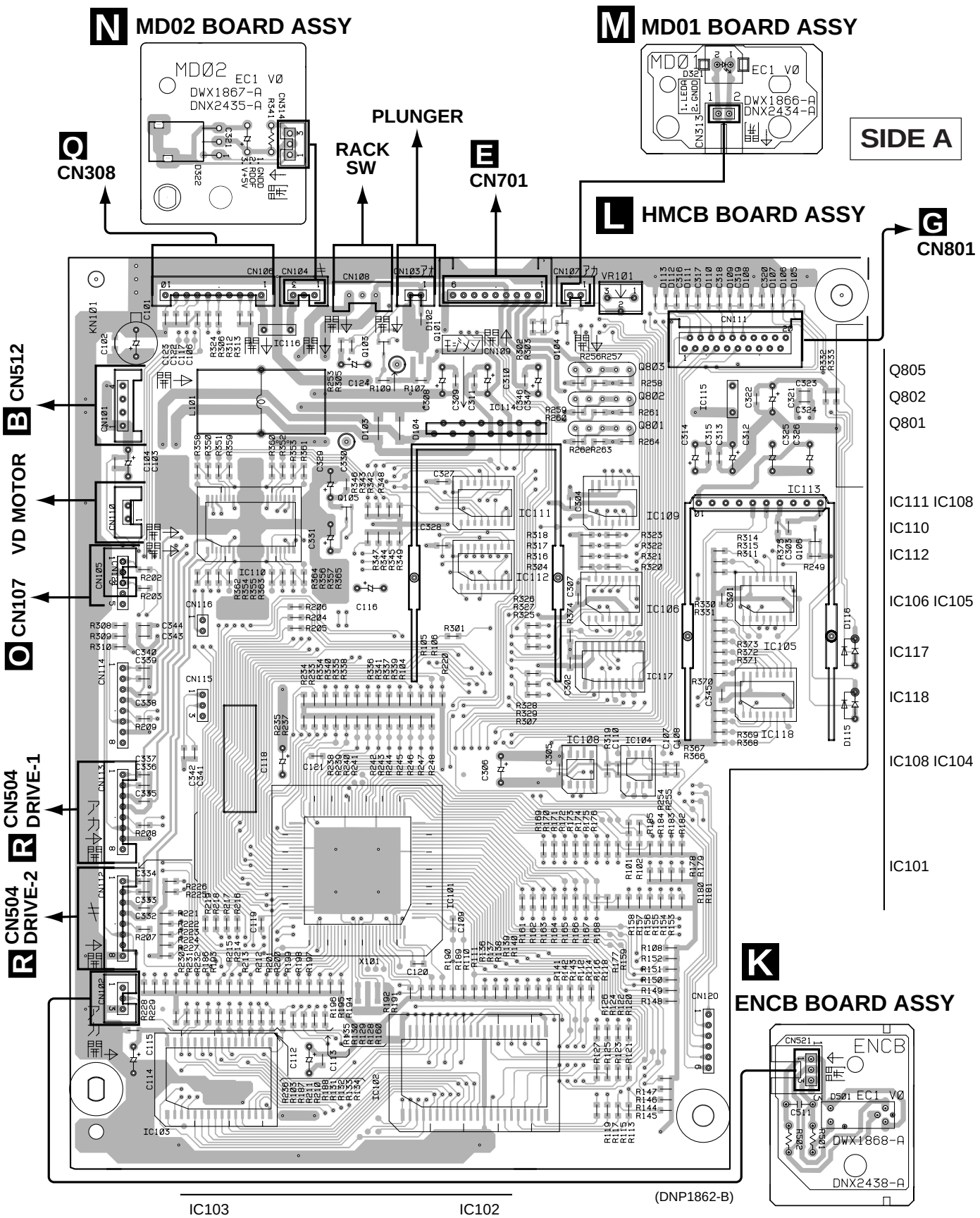
(DNP1865-C)

4.2 DCMB, DNSE, UPSE and DSEB BOARD ASSY



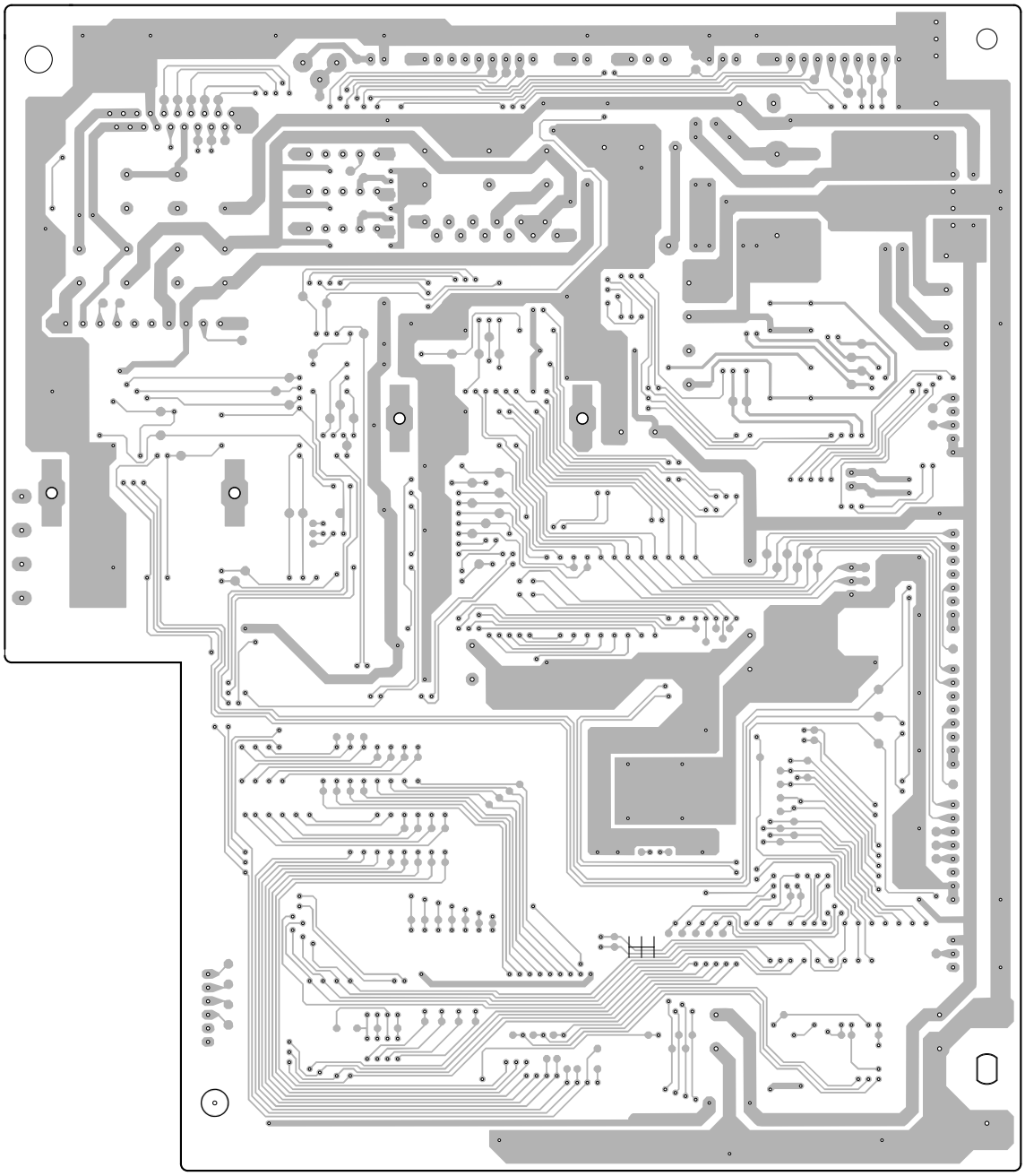


4.3 MD02, MD01, HMCB and ENCB BOARD ASSY



SIDE B

L HMCB BOARD ASSY



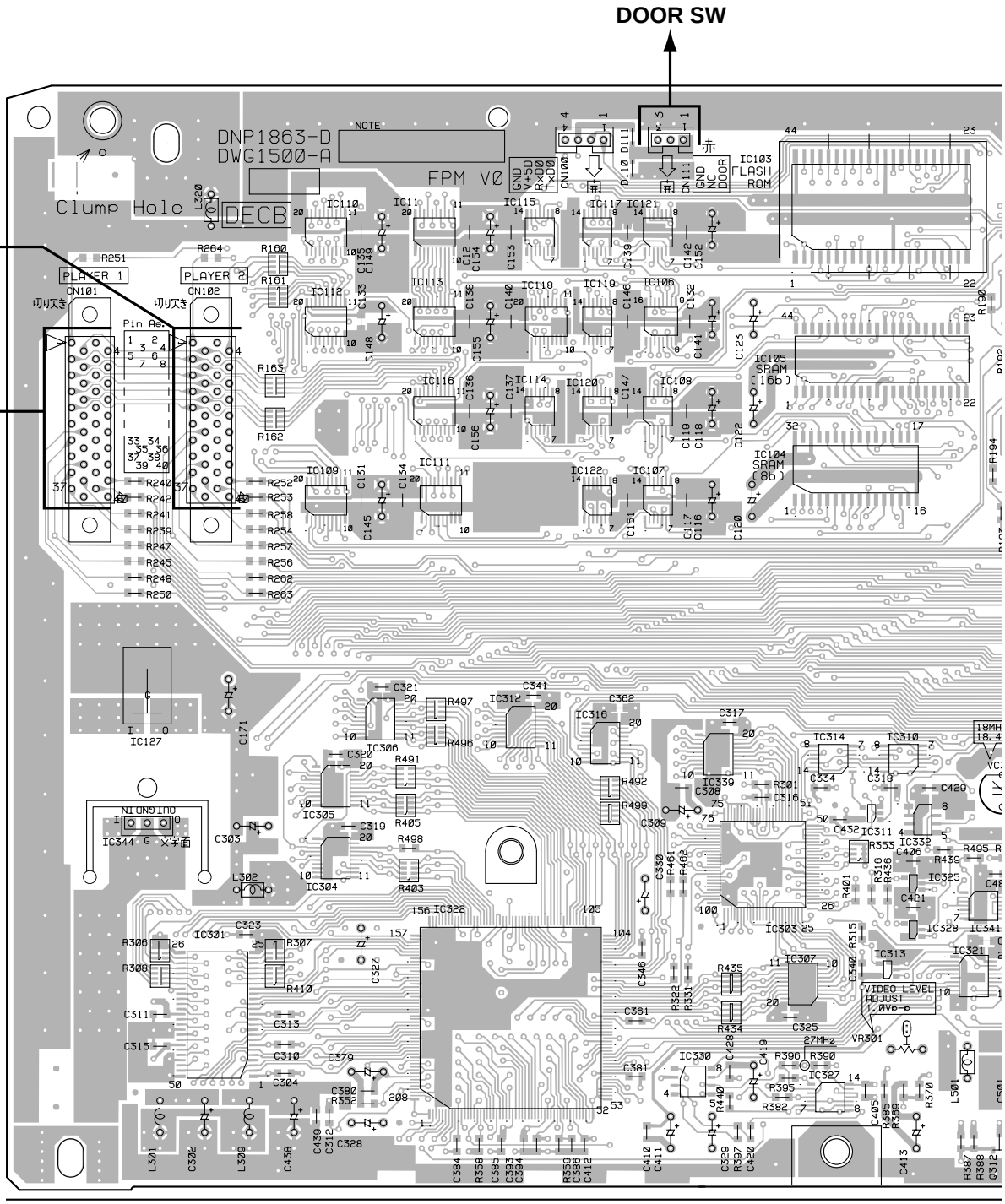
4.4 DECB BOARD ASSY

SIDE A

O DECB BOARD ASSY

R CN301 (DRIVE -2)

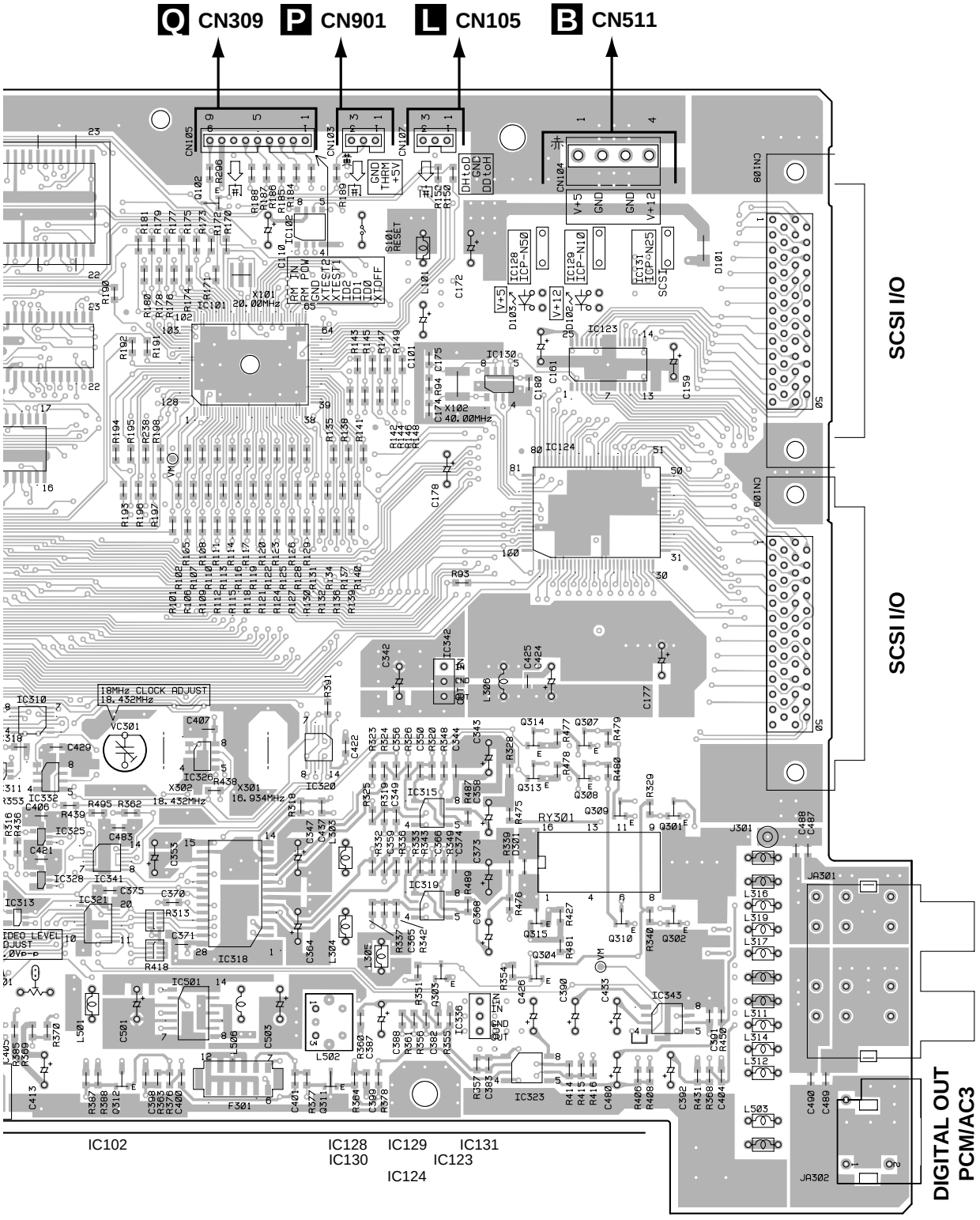
R CN301 (DRIVE -1)



IC110 IC11 IC15 IC117 IC121 IC103 IC102
IC112 IC113 IC118 IC119 IC103 IC105
IC116 IC114 IC120 IC108 IC104
IC109 IC111 IC122 IC107 IC103 IC105
IC306 IC312 IC316 IC339 IC314 IC310
IC305 IC311 IC332
IC304 IC303 IC341
IC301 IC322 IC33 IC307 IC327 IC313 IC321 IC501

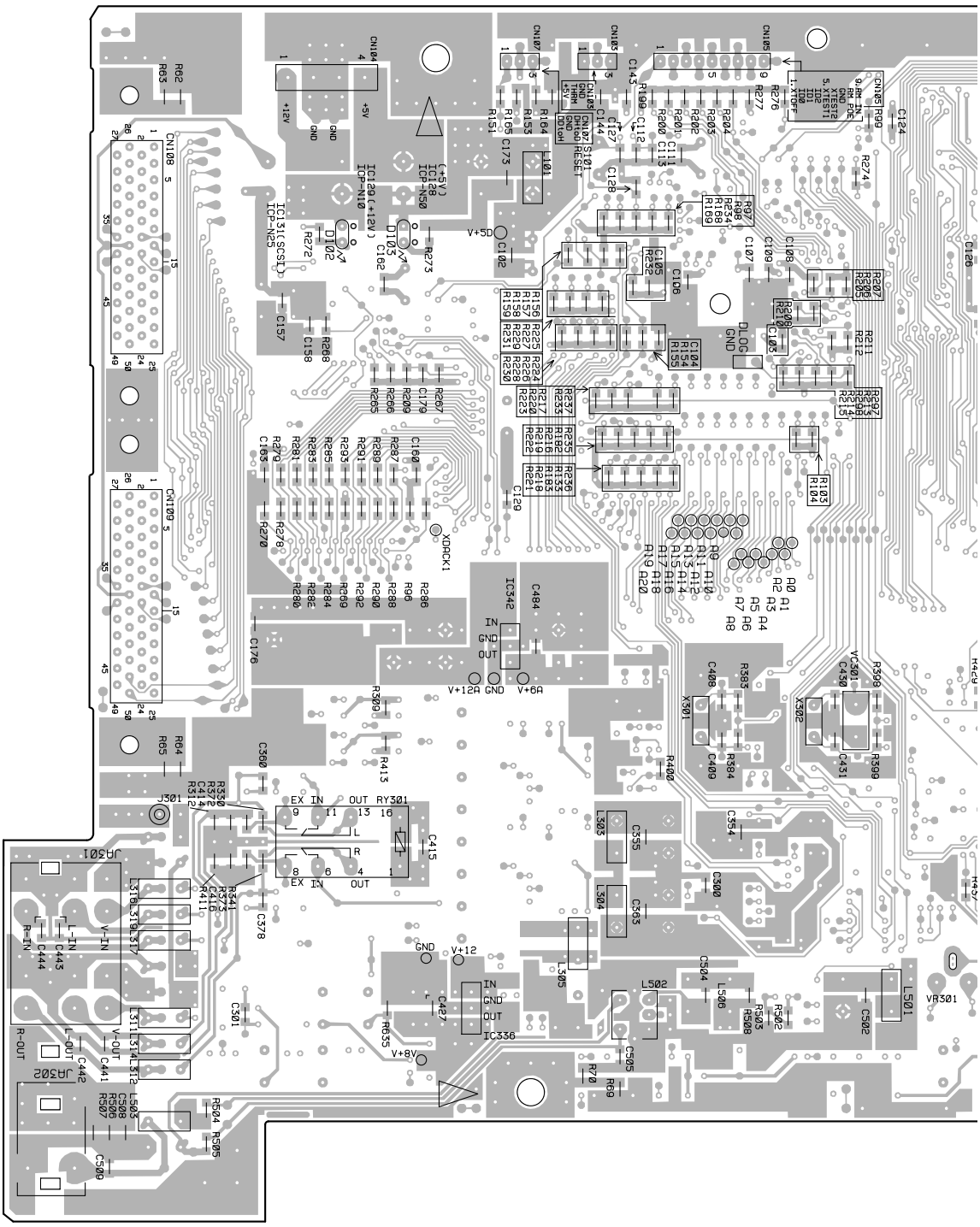
• This PCB is a four-layered board.
Midddle layer is a mainly connected to Vcc and GND.

SIDE A



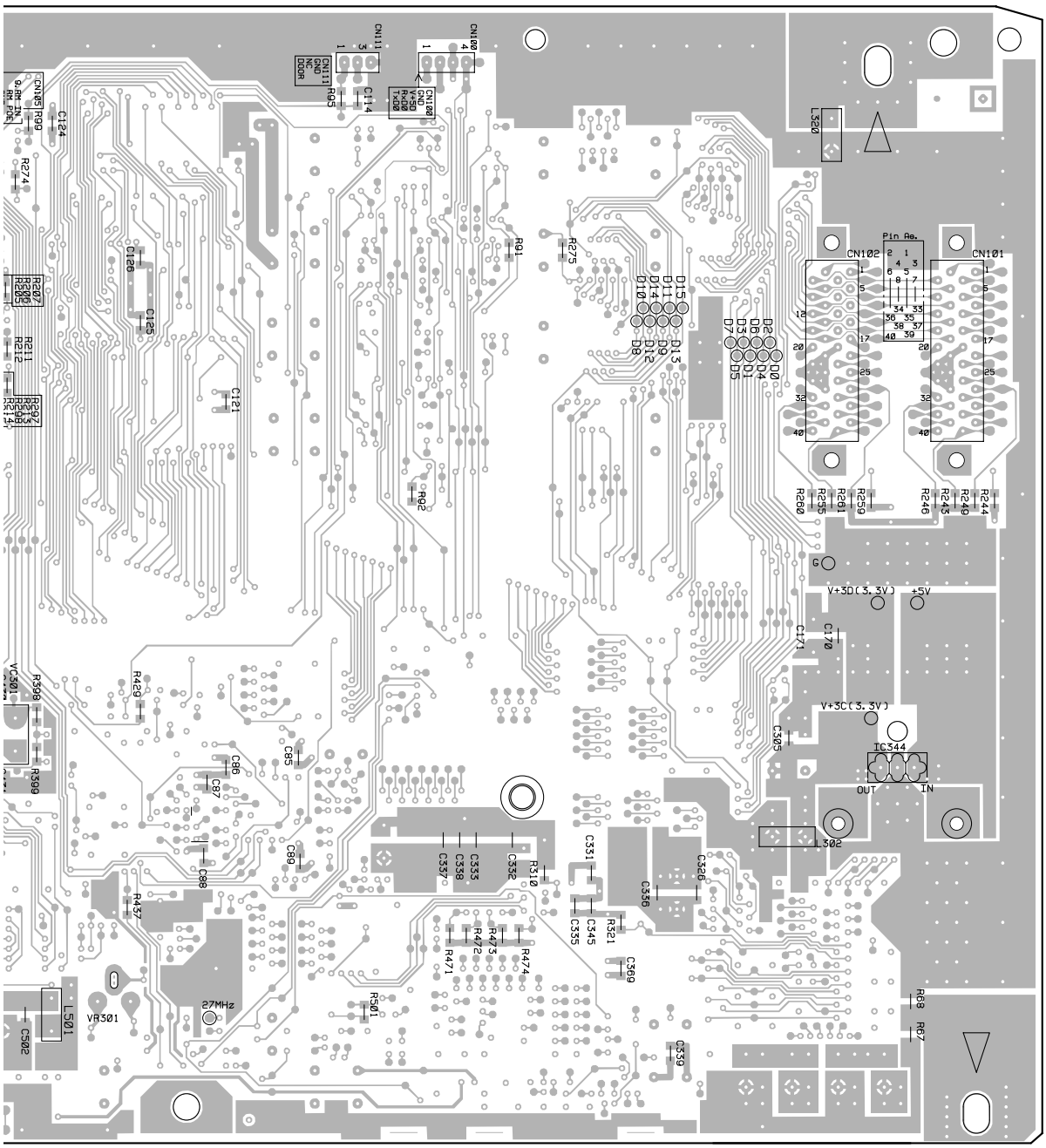
SIDE B

DECB BOARD ASSY



SIDE B

- **This PCB is a four-layered board.**
  Midddle layer is a mainly connected to Vcc and GND.



4.5 DVPL BOARD ASSY

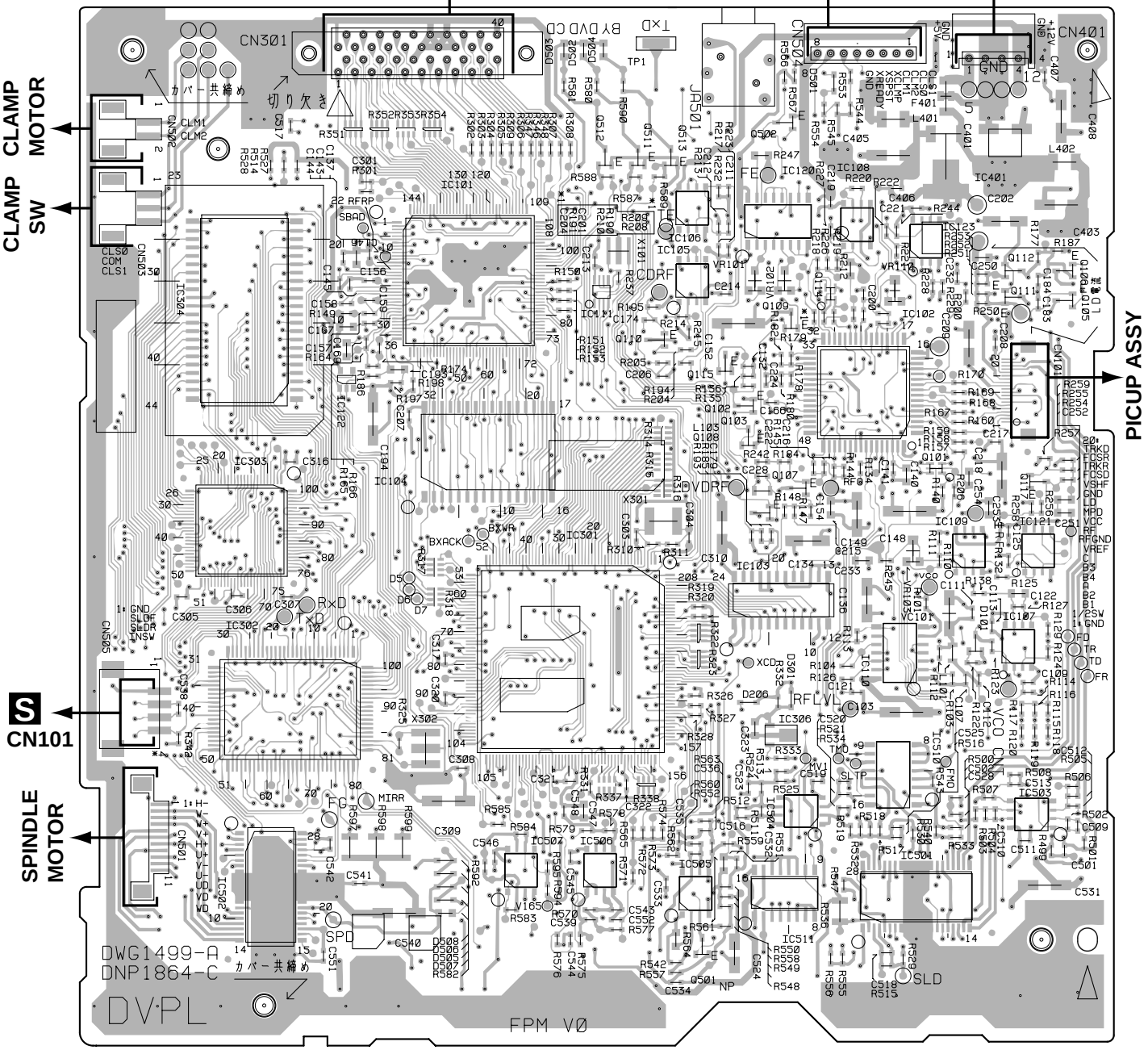
• This PCB is a four-layered board.
Midddle layer is a mainly connected to Vcc and GND.

SIDE A

R DVPL BOARD ASSY

O CN101 (DRIVE- 1)
O CN102 (DRIVE- 2)
L CN112(DRIVE- 1)
L CN113(DRIVE- 2)
B CN513(DRIVE- 1)
B CN514(DRIVE- 2)

CLAMP MOTOR
CLAMP SW
S CN101
SPINDLE MOTOR
PICUP ASSY



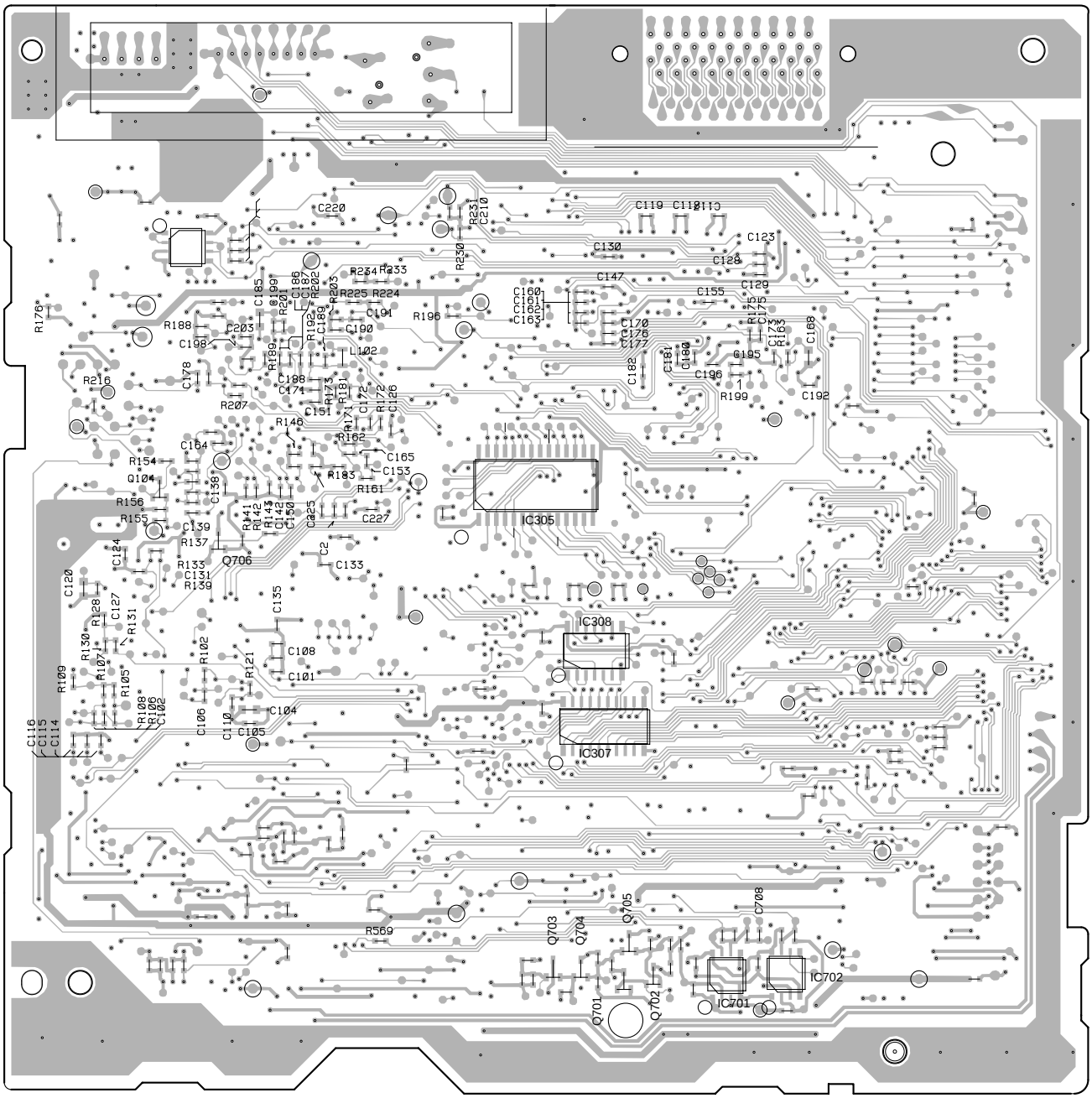
(DNP1864-C)

VR101 VR102 VR110 VR103

IC304 IC101 Q512 Q511 Q513 IC106 Q502 IC120 IC108 IC401 Q112 Q106
IC303 IC104 IC301 IC111 Q110 IC105 Q115 Q109 Q114 IC306 IC123 Q115 Q105
IC302 IC507 IC506 Q103 Q107 IC110 IC102 Q101 IC109 Q117
IC502 IC505 IC103 IC510 IC107 IC121
Q501 IC511 IC501 IC503

SIDE B

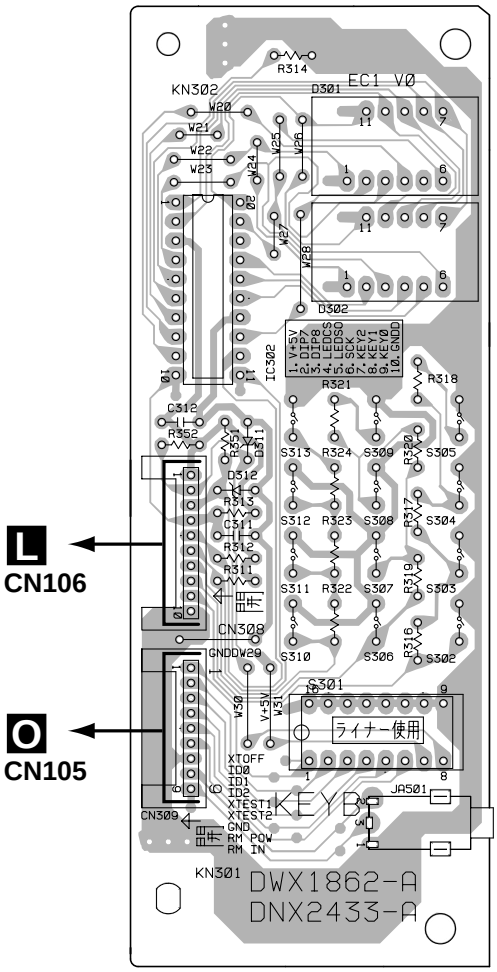
R DVPL BOARD ASSY



Q104 Q706 IC305 IC308 IC307 Q703 Q704 Q705 IC701 IC702 Q701 Q702

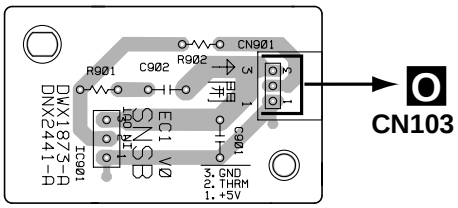
4.6 SNSB, KEYB BOARD ASSY

Q KEYB BOARD ASSY



(DNP1865-C)

P SNSB BOARD ASSY



6. PCB PARTS LIST

NOTES :
- *Parts marked by " NSP " are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 Ω → 56 × 10 [1] → 561 ..... RD1/4PU 5 6 1 J
47k Ω → 47 × 10 [3] → 473 ..... RD1/4PU 4 7 3 J
0.5 Ω → R50 ..... RN2H R 5 0 K
1 Ω → 1R0 ..... RS1P 1 R 0 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10 [1] → 5621 ..... RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
⚠		PWR BOARD ASSY	DWR1277
		KIPW BOARD ASSY	DWM2076
		├ PWRS BOARD ASSY	DWR1293
		├ PWRP BOARD ASSY	DWR1292
		├ PSWB BOARD ASSY	DWR1294
		├ INDB BOARD ASSY	DWX1869
		├ ILMB BOARD ASSY	DWX1870
		├ ENCB BOARD ASSY	DWX1868
		├ MD01 BOARD ASSY	DWX1866
		├ MD02 BOARD ASSY	DWX1867
		├ SNSB BOARD ASSY	DWX1873
		└ KEYB BOARD ASSY	DWX1862
		SWSE BOARD ASSY	DWM2021
		├ DCMB BOARD ASSY	DWX1706
		├ DNSE BOARD ASSY	DWX1708
		├ UPSE BOARD ASSY	DWX1709
		└ DSEB BOARD ASSY	DWX1707
		HMCB BOARD ASSY	DWG1501
		DECB BOARD ASSY	DWG1500
		DVPL BOARD ASSY	DWG1499
NSP		SERVO MECHANISM ASSY-S	DXX2423
NSP		└ INSB BOARD ASSY	VWG1759

A PWR BOARD ASSY

OTHERS

⚠	F1	(FUSE: T3.15AH / 250V)	DEK1080

B PWRS BOARD ASSY

OTHERS

⚠	H509 -H520	(FUSE HOLDER)	AKR1004
	CN512	(4P TOP POST)	B4B-EH
	CN510	(4P TOP POST)	B4P-VH
	CN511	(4P TOP POST)	B4P-VH-R
	KN501	(EARTH METAL FITTING)	VNF1084

C PWRP BOARD ASSY

COILS AND FILTER

⚠	F501		DTF1095

CAPACITORS

⚠	C503, C504	(10000PF)	ACG7020
⚠	C506, C507	(220PF)	DCG1025

OTHERS

⚠	H501 -H504	(FUSE HOLDER)	AKR1004
	CN505	(2P CONNECTOR)	B2P3-VH
	CN502	(4P CONNECTOR)	B4P7-VH
	CN503	(2P CONNECTOR)	B2P3-VH-R
	CN504	(2P CONNECTOR)	B2P3-VH-Y
		PCB BINDER	DEF1015
	KN502	(EARTH METAL FITTING)	VNF1084

D PSWB BOARD ASSY

CAPACITORS

⚠	C501, C502		ACG7020

SWITCH

⚠	S501		DSA1020

OTHERS

	CN501	(CONNECTOR 4P)	B4P7S-VH
		CAPACITORS COVER	VEC1912

E INDB BOARD ASSY

SEMICONDUCTORS

	D802, D803		SLP3118C51H
	D801, D804		SLP6118C51H

RESISTORS

	All Resistors		RD1/4PU □□□ J

OTHERS

	CN702	(4P CONNECTOR)	S4B-PH-K-S
	CN701	(9P CONNECTOR)	S9B-PH-K-S

F ILMB BOARD ASSY

SEMICONDUCTORS

	D805 -D807		LT5E8B
	D809 -D814		LT5H8B
	D816		LT5T8B
	D808		MPY5364X
	D815		TLOU114P

OTHERS

	801		PF04PG-B05

G DCMB BOARD ASSY

SEMICONDUCTORS

	IC871-IC875		TC7S14F
	Q877		2SA1037K
	D877		1SS355
	D876		GL381
	D871 -D875		GP1S24

CAPACITORS

	C871, C872		CKSQYF104Z50

RESISTORS

	R871	(100Ω)	DCN1039
	Other Resistors		RS1/10S □□□ J

Mark	No.	Description	Part No.
OTHERS			
	CN874	(3P CONNECTOR)	173981-3
	CN875	(4P CONNECTOR)	173981-4
	CN873	(3P CONNECTOR)	4-173981-3
	CN871	(FPC CONNECTOR)	52030-2010
	CN872	(3P CONNECTOR)	B3B-PH-K-S
	J871	(EARTH METAL FITTING)	DE005WE0
		LED HOLDER	RNK1795
H DNSE BOARD ASSY			
SEMICONDUCTORS			
	D841, D842		GP1A15
CAPACITORS			
	C841, C842		CKSQYF104Z50
RESISTORS			
	All Resistors		RS1/10S □□□ J
OTHERS			
	J841		PG04MR-E35
I UPSE BOARD ASSY			
SEMICONDUCTORS			
	D831		GP1A15
CAPACITORS			
	C831		CKSQYF104Z50
RESISTORS			
	All Resistors		RS1/10S □□□ J
OTHERS			
	J831	(CONNECTOR)	PG03MR-E35
J DSEB BOARD ASSY			
SEMICONDUCTORS			
	IC851		TC7S04F
	Q851		PT4850F
CAPACITORS			
	C851		CKSQYF104Z50
RESISTORS			
	VR851	(100kΩ)	DCP1081
	Other Resistors		RS1/10S □□□ J
OTHERS			
	J851	(CONNECTOR)	PG03MR4E22
K ENCB BOARD ASSY			
SEMICONDUCTORS			
	D501		GP1A58HR
CAPACITORS			
	C511		CKPUYF103Z25
RESISTORS			
	All Resistors		RD1/4PU □□□ J
L HMCB BOARD ASSY			
SEMICONDUCTORS			
⚠	IC110		BA6797FP
	IC117		BU2092F
	IC1020		DYW1606
	IC101		HD6415108F10
⚠	IC115, IC116		ICP-N15
	IC104		M51953BFP
	IC103		M5M51008BFP-70L
	IC108		NM93C86AEM8
⚠	IC113		TA7291P
⚠	IC114		TA8440H
	IC109		TC74HC00AF
	IC105		TC74HC165AF
	IC106, IC111, IC112		TC74HC4052AF
	IC102		VKH1012
	Q104, Q105		2PB709A
	Q801 -Q803		2SC5170
	Q101		2SD1614
	Q103		DTA124EK
	Q106		DTC124EK
	D102		1SS355
	D103, D104		EC10QS04
	D116		SLB-25MGTB7
	D115		SLB-25VRTB7
	D105 -D113		UDZS8.2B
COILS AND FILTER			
	L101		DTH1178
CAPACITORS			
	C325, C326		CEANP1R0M50
	C308		CEAT100M50
	C347		CEAT101M16
	C329, C331		CEAT1R0M50
	C101		CEAT331M16
	C103, C112, C114, C116, C118		CEAT470M10
	C124, C306, C310, C312, C321		CEAT470M10
	C314		CEAT4R7M50
	C107, C108		CKSQYB104K25
	C316 -C320		CKSQYB222K50
	C106, C109, C117, C122, C123		CKSQYF103Z50
	C333, C334, C336, C337		CKSQYF103Z50
	C102, C104, C110, C113, C115		CKSQYF104Z25
	C119 -C121, C301, C302		CKSQYF104Z25
	C304, C305, C307, C309, C311		CKSQYF104Z25
	C313, C315, C322 -C324		CKSQYF104Z25
	C327, C328, C330, C332, C335		CKSQYF104Z25
	C346		CKSQYF104Z25
	C303		CKSQYF105Z16
RESISTORS			
	R358 -R365		RS1/10S1201F
	R350 -R357		RS1/10S3301F
	VR101	(2kΩ)	DCP1034
	Other Resistors		RS1/10S □□□ J
OTHERS			
	CN111	(20P FPC CONNECTOR)	52030-2010
	CN110	(2P TOP POST)	B2B-EH
	CN103	(2P CONNECTOR)	B2B-PH-K-E
	CN108	(3P TOP POST)	B3B-EH
	CN102	(3P CONNECTOR)	B3B-PH-K-R
	CN105	(3P CONNECTOR)	B3B-PH-K-S
	CN104	(3P CONNECTOR)	B3B-PH-K-Y
	CN101	(4P TOP POST)	B4B-EH
	CN112	(8P CONNECTOR)	B8B-PH-K-Y
	CN109	(9P CONNECTOR)	S9B-PH-K-S
	KN101	(EARTH METAL FITTING)	VNF1084
	X101 (CERMIC RESONATOR 20MHz)		VSS1114

Mark	No.	Description	Part No.
M	**MD01 BOARD ASSY**		
	SEMICONDUCTORS		
	D321		SIR-56SB3H
	OTHERS		
	CN313	(CONNECTOR)	S2B-PH-K-S
N	**MD02 BOARD ASSY**		
	CAPACITORS		
	C321		CEAL1R0M50
	OTHERS		
	CN314	(3P CONNECTOR)	B3B-PH-K-Y
	322	(REMOTE RECEIVER UNIT)	GP1U27X
O	**DECB BOARD ASSY**		
	SEMICONDUCTORS		
	IC127		BA033FP
	IC344		BA033T
	IC315, IC319		BA4560F
	IC123		BH9595FP-Y
	IC330		CY2081SL-611
	IC1030		DYW1608
	IC101		HD6412350F-20
⚠	IC129		ICP-N10
⚠	IC131		ICP-N25
⚠	IC128		ICP-N50
	IC102		M51953BFP
	IC104		M5M51288BJ-20
	IC301		MB811171622A-100FN
	IC322		MB86371
	IC323		MC14577CF
	IC343		NJM2244M
	IC342		NJM78L06A
	IC336		NJM78L08A
	IC318		PD2026BM(L)
	IC303		PD4829B
	IC124		SYM53CF96-2-100QFP
	IC105		TC551664BJ-15
	IC501		TC74HCU04AF
	IC305, IC306		TC74LCX245FT
	IC114		TC74VHC00FT
	IC320, IC327, IC341		TC74VHC02FT
	IC107, IC108, IC119		TC74VHC08FT
	IC106		TC74VHC139FT
	IC121		TC74VHC21FT
	IC115, IC117		TC74VHC32FT
	IC120		TC74VHC393FT
	IC109, IC112, IC116, IC304, IC307		TC74VHC541FT
	IC312, IC316		TC74VHC541FT
	IC118, IC339		TC74VHC574FT
	IC122, IC310, IC314		TC74VHC74FT
	IC111, IC321		TC74VHCT541AFT
	IC110, IC113		TC74VHCT573AFT
	IC313		TC7S04F
	IC311		TC7S08F
	IC325, IC328		TC7SHU04F
	IC130, IC326, IC332		TC7WU04F
	IC103		VKH1012
	Q304, Q307, Q308, Q311, Q312		2SA1037K
	Q315		2SC2412K
	Q301, Q302, Q309, Q310		2SD2114K
	Q102, Q303, Q313, Q314		DTC124EK
	D301		1SS355
	D101		D1FS4
	D102, D103		SLP3118C51H
	COILS AND FILTER		
	L301, L306, L309		LFA220J
	L502		PTL1003
	L506		RTF1167
	F301	(5.0MHz)	VTF1098
	L101, L302 -L305, L311, L312		VTH1020
	L314, L316, L317, L319, L501		VTH1020
	L503		VTH1020
	RELAYS		
	RY301		ASR1040
	CAPACITORS		
	C408		CCSQCH100D50
	C431		CCSQCH240J50
	C409		CCSQCH270J50
	C349, C350, C365, C366		CCSQCH470J50
	C420		CCSQCH560J50
	C383		CCSQCH5R0C50
	C174, C175		CCSQCH7R0D50
	C356, C359		CCSQCH820J50
	C430		CCSQCH8R0D50
	C390, C433		CEAT100M50
	C302, C303, C309, C329, C353		CEAT101M10
	C413, C419, C438, C480, C501		CEAT101M10
	C503		CEAT101M10
	C342, C343, C373, C426		CEAT101M16
	C424		CEAT101M25
	C178		CEAT470M10
	C358, C368		CEAT470M16
	C110, C116, C118, C120		CEAT470M25
	C122, C123, C141, C145		CEAT470M25
	C148, C149, C152, C154 -C156		CEAT470M25
	C159, C161		CEAT470M25
	C101, C171, C172, C347, C364		CEAT471M10
	C392		CEAT471M10
	C177		CEAT471M16
	C327, C328, C330, C379, C411		CEHAQ101M10
	C509		CKSQYB221K50
	C370, C504		CKSQYF103Z50
	C102 -C109, C111 -C114, C117		CKSQYF104Z25
	C119, C12 , C121, C124 -C128		CKSQYF104Z25
	C131 -C140, C142, C144		CKSQYF104Z25
	C146, C147, C151, C153		CKSQYF104Z25
	C157, C158, C160, C162, C163		CKSQYF104Z25
	C170, C173, C176, C179, C180		CKSQYF104Z25
	C301, C304, C308, C310, C311		CKSQYF104Z25
	C313, C315 -C321, C323		CKSQYF104Z25
	C325, C326, C331 -C341		CKSQYF104Z25
	C344 -C346, C354, C355		CKSQYF104Z25
	C361 -C363, C369, C371		CKSQYF104Z25
	C374, C375, C380 -C382		CKSQYF104Z25
	C384, C385, C391, C393, C394		CKSQYF104Z25
	C398, C399, C405 -C407, C410		CKSQYF104Z25
	C412, C415, C421, C422, C425		CKSQYF104Z25
	C427 -C429, C432, C437, C439		CKSQYF104Z25
	C483, C484, C502, C85 -C89		CKSQYF104Z25
	C305		CKSQYF105Z16
	VC301	(20pF)	VCM-008

Mark	No.	Description	Part No.
RESISTORS			
	R353, R418		RA4C103J
	R160 -R163, R306 -R308, R313		RA4C220J
	R403, R405, R410, R434, R435		RA4C220J
	R491, R492, R496, R497, R499		RA4C220J
	R355, R357, R414		RS1/10S1001F
	R356		RS1/10S1201F
	R387		RS1/10S1500F
	R406, R408, R415, R416		RS1/10S2001F
	R319, R320, R342, R343		RS1/10S4702F
	R368		RS1/10S68R0F
	R450, R504		RS1/10S75R0F
	VR301 (1kΩ)		VCP1151
	Other Resistors		RS1/10S □□□ J
OTHERS			
	CN111	(3P CONNECTOR)	B3B-PH-K-R
	CN107	(3P CONNECTOR)	B3B-PH-K-S
	CN103	(3P CONNECTOR)	B3B-PH-K-Y
	CN100	(4P CONNECTOR)	B4B-PH-K-S
	CN104	(4P TOP POST)	B4P-VH-R
	JA301	(6P PIN JACK)	DKB1047
	CN101, CN102 (40P CONNECTOR)		DKN1186
	CN108, CN109 (CONNECTOR)		DKP3292
	X102	(CERAMIC RESONATOR) 40.0MHz	DSS1087
	JA302	(1P PIN JACK)	VKB1102
	X301	(CERAMIC RESONATOR) 16.934MHz	VSS1081
	X101	(CERAMIC RESONATOR) 20.00MHz	VSS1114
	X302	(CRYSTAL RESONATOR) 18.432MHz	VSS1116

P SNSB BOARD ASSY

SEMICONDUCTORS			
	IC901		LM35DZ
CAPACITORS			
	C902		CFTYA105J50
	C901		CGCYF104Z25
RESISTORS			
	All Resistors		RD1/4PU □□□ J

Q KEYB BOARD ASSY

SEMICONDUCTORS			
	IC302		MC14489P
	D301, D302		LB-303MK
	D311, D312		MTZJ8.2B
SWITCHES			
	S301		OSX1007
	S302 -S313		RSG1034
CAPACITORS			
	C311, C312		CKPUYF103Z25
RESISTORS			
	All Resistors		RD1/4PU □□□ J
OTHERS			
	JA501	(MINI JACK)	DKN1146
	CN308	(10P CONNECTOR)	S10B-PH-K-S
	CN309	(9P CONNECTOR)	S9B-PH-K-S
	KN301, KN302 (EARTH METAL)		VNF1084

Mark	No.	Description	Part No.

R DVPL BOARD ASSY

SEMICONDUCTORS			
	IC401		BA033FP
	IC501		BA6797FP
	IC502		BA6849FP
	IC3040		DYW1607
	IC305		HM514800CJ-7
	IC104		KM681000CLG-5L
	IC102		LA9700M
	IC306		M51943BML
	IC101		MB86562
	IC302		MB90T678-B
	IC109		NJM082M
	IC107, IC504, IC701		NJM2100M
	IC105, IC106, IC108, IC503		NJM2904M
	IC505-IC507		NJM2904M
	IC121, IC702		NJM311M
	IC303		PD4829B
	IC301		PD4833A
	IC120, IC510, IC511		TC74HC4053AF
	IC308		TC74HCT04AF
	IC307		TC74HCT245AF
	IC110		TC74HCU04AF
	IC122		TC7S66F
	IC111		TC7WU04FU
	IC103		TLC5540INS
	IC304		VKH1012
	Q104, Q106, Q107, Q110, Q704		2PB709A
	Q105, Q108, Q109, Q111, Q112		2PD601A
	Q117, Q511 -Q513, Q703		2PD601A
	Q705, Q706		2PD601A
	Q102		DTA124EK
	Q103, Q115, Q501, Q502		DTC124EK
	Q101, Q114		HN1K03FU
	D206, D301, D505 -D508		1SS355
	D101		KV1410
	D501		RB751V-40
	D503, D504		SML-210DT
	D502		SML-210MT
COILS AND FILTER			
	L402 (4.7µH)		DTL1024
	L401 (22 µH)		OTL1009
	F401		QTF1025
	L101		VTL1059
	L102, L103		VTL1061
CAPACITORS			
	C200		CCSRCH151J50
	C188, C224, C227		CCSRCH180J50
	C301		CCSRCH181J50
	C161, C163, C187, C204		CCSRCH220J50
	C186		CCSRCH221J50
	C201, C703		CCSRCH271J50
	C111, C121, C150, C176, C216		CCSRCH330J50
	C234		CCSRCH330J50
	C525, C526		CCSRCH390J50
	C174		CCSRCH391J50
	C108, C110, C116, C701		CCSRCH470J50
	C123, C128, C520, C522		CCSRCH471J50
	C190, C229		CCSRCH560J50
	C189, C228, C303, C304		CCSRCH5R0C50
	C707		CCSRCH820J50

Mark	No.	Description	Part No.
	C139		CCSRCH8R0D50
	C408, C531		CEV101M16
	C103, C148, C152, C194		CEV101M6R3
	C309, C310, C401, C403, C405		CEV101M6R3
	C149		CEV220M16
	C540		CEV470M16
	C134, C136, C202, C209, C218		CEV470M6R3
	C524		CEVNP4R7M16
	C120, C122, C140, C143		CKSQYB105K10
	C168, C169, C185, C233, C251		CKSQYB105K10
	C253, C254, C323, C547		CKSQYB105K10
	C193, C532		CKSQYB334K16
	C167		CKSQYB474K16
	C104, C215, C250		CKSQYF105Z16
	C106, C127, C521, C527, C528		CKSRYB102K50
	C107, C112, C178, C197		CKSRYB103K50
	C225, C226, C235, C325		CKSRYB103K50
	C501, C502, C543, C99		CKSRYB103K50
	C102, C105, C114, C115, C137		CKSRYB104K16
	C144, C145, C156 -C159, C173		CKSRYB104K16
	C198, C203, C206, C208, C217		CKSRYB104K16
	C534, C544, C548		CKSRYB104K16
	C509, C510, C512, C513		CKSRYB153K50
	C535, C536		CKSRYB153K50
	C702		CKSRYB183K25
	C126		CKSRYB222K50
	C195, C231		CKSRYB223K25
	C523		CKSRYB273K16
	C306, C518, C552		CKSRYB332K50
	C551		CKSRYB393K16
	C142, C155, C517, C538, C708		CKSRYB473K16
	C516		CKSRYB563K16
	C539		CKSRYB822K50
	C113, C117 -C119, C124, C125		CKSRYF104Z16
	C129, C130, C133, C135, C138		CKSRYF104Z16
	C146, C147, C151, C154, C164		CKSRYF104Z16
	C170, C171, C175, C180 -C184		CKSRYF104Z16
	C192, C196, C207, C210 -C214		CKSRYF104Z16
	C219, C220, C302, C305		CKSRYF104Z16
	C307, C308, C311 -C322, C324		CKSRYF104Z16
	C326 -C328, C402, C404		CKSRYF104Z16
	C406, C407, C511, C515, C519		CKSRYF104Z16
	C530, C533, C537, C541, C542		CKSRYF104Z16
	C545, C546, C705, C706		CKSRYF104Z16
	VC101 (40pF)		VCM1010
RESISTORS			
	R317, R318		RA4C101J
	R314 -R316, R322, R323		RA4C103J
	R337, R338		RA4C103J
	R351 -R354		RA4C220J
	R212, R247, R564, R582		RS1/10S0R0J
	R254		RS1/16S1001F
	R213, R217, R223, R232, R510		RS1/16S1002F
	R520, R521, R523, R537, R546		RS1/16S1002F
	R575, R584, R594, R595		RS1/16S1002F
	R535		RS1/16S1301F
	R534		RS1/16S1500F
	R143		RS1/16S1502F
	R501, R505		RS1/16S1603F
	R256		RS1/16S1800F
	R538, R547		RS1/16S2401F
	R503, R507		RS1/16S2403F
	R190, R204		RS1/16S2702F
	R522		RS1/16S4701F
	R502, R504, R506, R508, R515		RS1/16S4702F
	R529		RS1/16S4702F
	R516, R530		RS1/16S5102F
	R531, R539		RS1/16S5602F
	R536, R597 -R599		RS1/4S1R0J
	VR101, VR103, VR110 (2.2kΩ)		PCP1023
	Other Resistors		RS1/16S □□□ J
OTHERS			
	CN505	(CONNECTOR)	3-179123-4
	CN501	(CONNECTOR)	52271-1190
	JA501	(MINI JACK)	DKN1185
	CN301	(IDC TYPE 40P CONNECTOR)	DKN1186
	X302	(CERAMIC RESONATOR) 4.0MHz	DSS1088
	X301	(CERAMIC RESONATOR) 27.00MHz	DSS1092
	X101	(CERAMIC RESONATOR) 16.934MHz	DSS1097
	TP1		RKF1002
	CN502	(2P CONNECTOR)	S2B-PH-SM3
	CN503	(3P CONNECTOR)	S3B-PH-SM3
	CN101	(20P CONNECTOR)	VKN1177

S INSB BOARD ASSY

SWITCH

	S101		DSG1017

OTHERS

	CN101	(4P CONNECTOR)	173981-4

6. ADJUSTMENT

6.1 PREPARATION FOR ADJUSTMENT OF THE UNIT

● Outline of Adjustment

1. Adjustment of Mechanical Operations

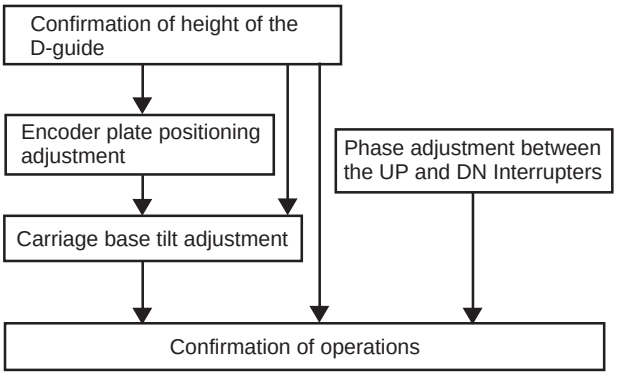
(a) Confirmation of height of the D-guide
Confirm the height of the D-guide, measured from the reference surface of the carriage base to the tip of the D-guide.

(b) Encoder plate positioning
Adjust the position of the encoder plate so that the stop position of the carriage base is aligned with the disc rack of the disc stocker.

(c) Carriage base tilt adjustment
Adjust the tilt of the carriage base against the disc stocker.

(d) Phase adjustment between the UP and DN Interrupters
Adjust the range of stop position of the carriage base during horizontal movement.

(e) Confirmation of operations after adjustment


Confirmation of height of the D-guide
Encoder plate positioning adjustment
Phase adjustment between the UP and DN Interrupters
Carriage base tilt adjustment
Confirmation of operations

- Carriage base tilting adjustment must be done every time after encoder plate positioning is adjusted.
- Interrupter phase adjustment should be done as required, but also whenever other adjustments have been made.
- Confirmation of the height of the D-guide may be done as required, before encoder plate positioning and carriage base tilt adjustment.

2. Sensitivity adjustment of the disc detection sensor of the carriage base

Adjust the sensitivity of the disc sensor of the carriage base.

3. Sensitivity adjustment of disc-out sensor

Adjust the sensitivity of the sensor for detecting a disc protruding from the disc stocker.

4. Voltage adjustment of SW power output

● Tools to be prepared

(The tools to be used at each process are indicated by letters (a) through (h) below at the end of explanation of the each process.)

(a) Phillips screwdriver (nominal size 2, for an M3 recessed-head Phillips machine screw)
(b) Phillips screwdriver (nominal size 3, for an M2.6 recessed-head Phillips machine screw)
(c) Hexagonal wrench (nominal size 2.5, for a hexagon socket head cap screw M3)
(d) Hexagonal wrench (nominal size 1.5, for a hexagon socket set screw M3)
(e) Adhesive
(f) Disc for adjustment
(g) Filter for adjustment
(h) Screwdriver for volume adjustment (2.4 mm, non conductive)

● Notes

- Adjustments of mechanical operations are done by visual judgment. Proceed with the adjustments in a bright location, such as under a fluorescent light.
- The position of the carriage base during Horizontal Manual mode of Super Manual Operation will be indicated on the lower mode indicator. This will be indicated in brackets, such as [25], hereinafter in this manual.
- To move the carriage base manually, remove the rear part and rotate the horizontal motor or the pulley in the gear box.

* Counterclockwise rotation: carriage base travels left
Clockwise rotation: carriage base travels right
See "How to move the carriage base manually to the right and left" (page 92) in "7.2.1 DISASSEMBLY"

6.2 ADJUSTMENT OF MECHANICAL OPERATIONS

6.2.1 Encoder plate positioning

- Objective : Adjust the position of the unit's encoder plate so that the stop position of the carriage base (D-guide L) will be aligned with the disc rack of the disc stocker.
- Method : Use the encoder plate positioning screw for adjustment.
- Preparation : Prepare a disc stocker. (Do not insert discs into Disc slots No. 1 through 6 at the left side.)
  Set the unit to Horizontal Manual Operation mode.
  (For left travel : [50] + [ENT] [7] ,
  for right travel : [50] + [ENT] [9])

* After encoder plate positioning, be sure to proceed to the carriage base tilt adjustment.

(1) Move the carriage base to a position where the loading motor can be rotated (around [5] to [25]).
(2) After removing the disc stocker, turn the loading motor manually so that the D-guide comes out toward you, then turn it in the reverse direction until the D-guide is about 1 mm out of the upper plate (state of the turntable just before beginning to rotate).

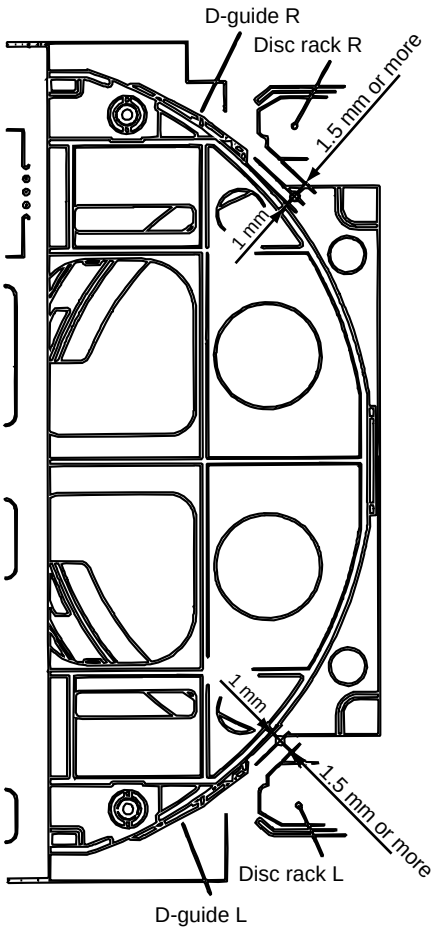


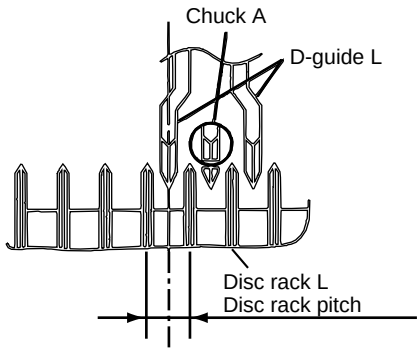
Fig. 1 Protruding width of the D-guide

(3) Install the disc stocker. Inspect the unit from the left side and check that the gap between the D-guide and the disc rack is 1.5 mm or more.
(4) Move the carriage base by using the [7] button and [9] button and stop at the position [5] from both sides (for example, from [1] to [5], then [10] to [5]).

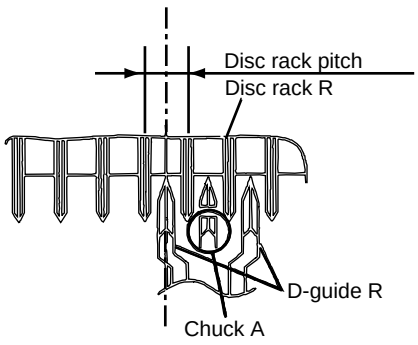
(**Caution**: Moving the carriage base with the D-guide and the disc rack in contact may cause trouble.)

(5) Inspect by eyes through the rectangular hole at the left part of the disc stocker visually, and check that the gap between the slots of the disc rack L and the D-guides L at the lower part is less than 0.2 mm. Perform the same inspection from the right side. If the gap is more than 0.2 mm, proceed to the following adjustment steps (6) and after.

(**Note**: Do not use the Chuck A position, as this is not accurate.)



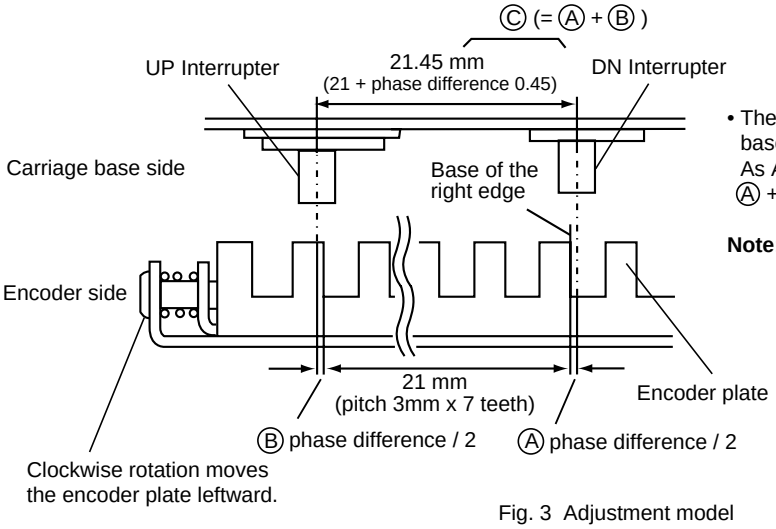
Proper position: D-guide centered on the disc rack slot
[Lower part]



Proper position: D-guide centered on the disc rack slot
[Upper part]

Fig. 2 D-guide position

(6) Loosen the lock screw until more than 1 mm space for adjustment becomes available (d).
(7) If the D-guide is displaced rightward, turn the positioning screw clockwise as necessary. If the D-guide is displaced leftward, turn it counterclockwise as necessary (b). (The travel of the D-guide per rotation of the positioning screw is 0.45 mm.)
(8) Fix the lock screw (lock torque 0.6 kg-cm). Repeat steps (4) and (5) and check that the gaps are less than 0.2 mm. If the gaps remains greater than 0.2 mm, repeat the step (6) and after.
(9) After the adjustment is completed, tighten the lock screw (e).



• The illustration at left represents the center of the carriage base stop position, and this is the final status of the adjustment. As A>0 and B>0 in the stop position, the stop range is Ⓐ +Ⓑ, and the stop range is equal to the phase difference.

Note: When the interrupter is shaded, the LED lights.

Fig. 3 Adjustment model

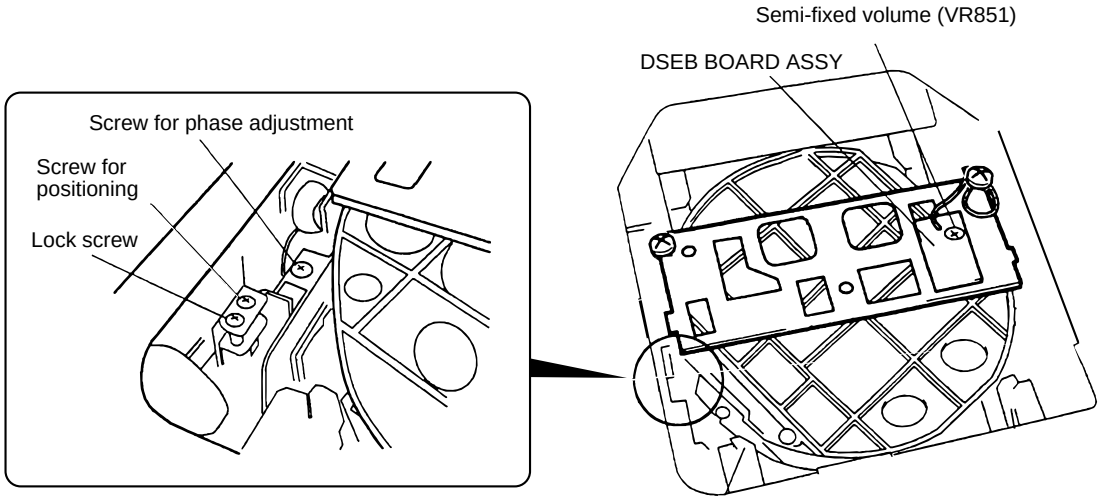


Fig. 4 Encoder positioning adjustment locations

6.2.2 Carriage Base Tilt Adjustment

- Objective : Adjust the positioning of the movable upper side relative to the fixed lower side. Adjust the tilt of the carriage base and align the D-guide R with the disc rack of the disc stocker.
- Method : Use the eccentric bushing to move the belt stopper on the upper side.
- Preparation : Prepare a disc stocker. (Do not insert discs into Disc slots No. 1 through 6 at the left side.) Set the unit to Horizontal Manual Operation mode. (For left travel: 50 + ENT 7 , for right travel: 50 + ENT 9)

(1) Move the carriage base to a position where the loading motor can be rotated (around [5] to [25]).
(2) After removing the disc stocker, turn the loading motor manually so that the D-guide comes out toward you, then turn it in the reverse direction until the D-guide is about 1 mm out of the upper plate (state of the turntable just before beginning to rotate). (See Fig. 1, page 73.)
(3) Install the disc stocker. Inspect the unit from the left side and check that the gap between the D-guide and the disc rack is 1.5 mm or more.
(4) Move the carriage base by using the 7 button and 9 button and stop at a position [5] from both sides (for example, from [1] to [5], then [10] to [5]).

(**Caution** : Moving the carriage base with the D-guide and the disc rack in contact may cause trouble.)

(5) Inspect by eyes through the rectangular hole at the left part of the disc stocker (or through the holes from the top) visually, and check that the gap between the slots of the disc rack R and the D-guides R at the upper part is less than 0.2 mm. Perform the same inspection from the right side. If the gap is more than 0.2 mm, proceed to the following adjustment steps (6) and after. (See Fig. 2, page 73.)

(**Note** : Do not use the Chuck A position, as this is not accurate.)

(6) Move the carriage base to the right (around [39]) for adjustment using the eccentric bushing.
(7) Loosen the hexagon head fixing bolt, then tighten the bolt temporarily. Remove the adhesive (c).
(8) If the D-guide is displaced rightward, turn the eccentric bushing counterclockwise as necessary. If the D-guide is displaced leftward, turn it clockwise as necessary. Tighten the hexagon head bolt.
(9) Repeat steps (4) and (5) and check that the gaps are less than 0.2 mm. If the gaps remains greater than 0.2 mm, repeat step (6) and after.
(10) After the adjustment is completed, tighten the lock screw (e).

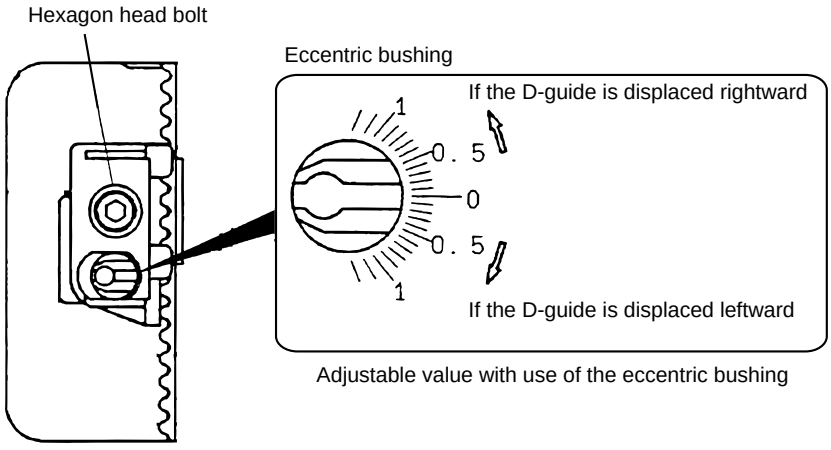
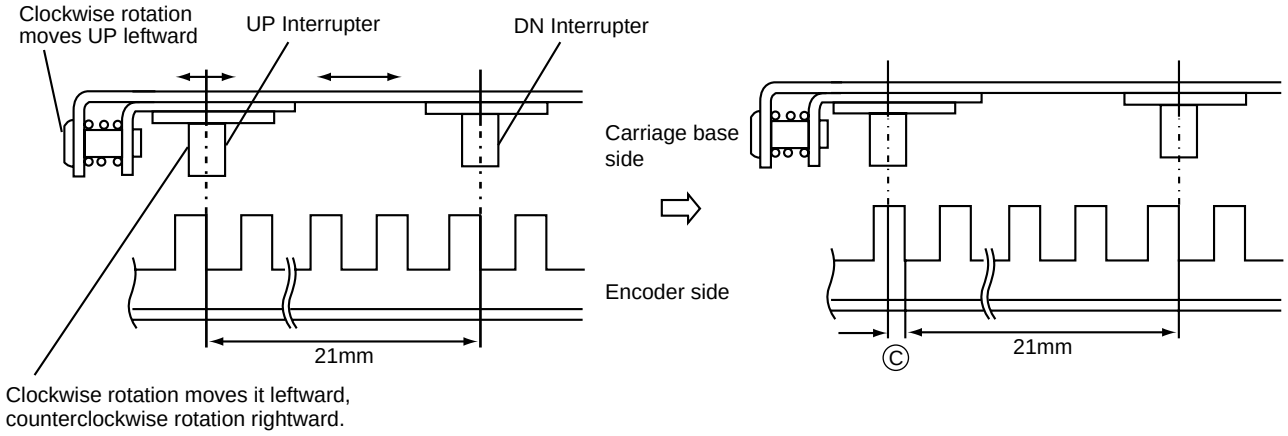


Fig.5 Hole for adjustment of the U-shaped part of the mechanical frame (when the carriage base position is [39])

6.2.3 Phase Adjustment of the UP and DN Interrupters

- Objective : Adjust the phase difference (relative distance) of the movable UP Interrupter and fixed DN Interrupter relative to the edge of the encoder plate to 0.45 ± 0.05 mm.
- Method : For adjustment, use the phase adjustment screw on the carriage base.
  The LED for monitoring the interrupter output is located on the HMCB UNIT. (After the disc stocker is removed, it is possible to monitor the LED from the front.)
  (UP Interrupter: green, DN Interrupter: red)
- Preparation : Set the unit to Horizontal Manual Operation mode.
  (For left travel: 50 + ENT 7 , for right travel: 50 + ENT 9)

(1) Move the carriage base to the left ([2] to [5]).
(2) Remove the disc stocker.
(3) While monitoring the red LED, slowly move the carriage base to the left by hand, and stop it as soon as the red LED lights. Be sure that the carriage base is moved from the right to the left when it is stopped.
(4) Turn the phase adjustment screw clockwise and stop it as soon as the green LED lights. (If the green LED is already lit, turn the phase adjustment screw counterclockwise until the LED goes dark, then proceed to this step) (b).
(5) For confirmation, move the carriage base to the right until the red LED goes dark, then slowly move it to the left. Check that two LEDs light at the same time. If they do not, repeat steps (3) and after.
(6) Again move the carriage base to the right until the red LED goes dark, then slowly move it to the left, and stop moving it as soon as the two LEDs light at the same time. Be sure that the carriage base is moved from the right to the left when it is stopped.
(7) Turn the phase adjustment screw clockwise one full turn (350 to 370 degrees) and stop.
(8) After the adjustment is completed, tighten the lock screw (e).



Note: The LEDs light when the interrupters are shaded.
- During UP-DN phase adjustment, Ⓒ is adjusted.
  Align DN with the right edge of one encoder slit (step 3,) then align UP with the right edge of the other (step 4, upper-left illustration).
  After confirming the UP and DN positions (step 5,) align DN with the right edge again (step 6) and move UP by (c) to the left (step 7, upper right illustration).

Fig. 6 Adjustment model

6.2.4 Confirmation of the height of the D-guides L and R (reference)

- Objective : Confirm that the height of the D-guides L and R on the carriage base, measured between the tip of a D-guide and the reference surface, is 31 ± 0.2 mm.
- Preparation : Remove the disc stocker and press the Rack switch to release operation limitation. Set the unit to Horizontal Manual Operation mode. (For left travel: 50 + ENT 7 , for right travel: 50 + ENT 9)

A. Left side

(1) Move the carriage base to a position where it can be seen from the front and where it does not interfere with the rotation of the loading motor (around [5] to [25]).
(2) Rotate the turntable counterclockwise in Manual Loading Operation mode (for counterclockwise rotation: ENT + 7 , for clockwise rotation: ENT + 9).
(**Caution** : Clockwise rotation of the turntable may cause trouble. Never turn it clockwise.)
(3) Stop the turntable at a point where it is turned about 70 degrees from the front.
(4) Check by measuring from the front that the distance between the top of the carriage base and the upper side of the D-guide is 31 ± 0.2 mm.

B. Right side

(1) Rotate the turntable counterclockwise, as described in step (2) above, by about 290 degrees from the front, and stop it.
(2) Check the D-guide height as described in step (4) above.

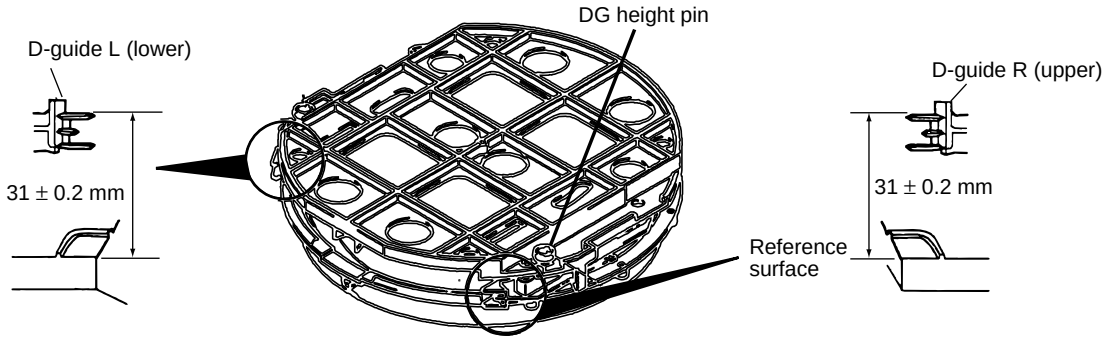


Fig. 7 Confirmation of the height of the D-guides

6.2.5 Operation Check After Adjustments

(1) Set the unit to Manual Horizontal Operation mode. (For left travel: 50 + ENT 7 , for right travel: 50 + ENT 9)
(2) Install the disc stocker. (Do not insert discs into Disc slots No. 1 through 6 at the left side.)
(3) Move the carriage base to locate it at [5].
(4) In Manual Loading Operation mode, turn the turntable clockwise by pressing the ENT button then repeatedly pressing the 9 button lightly so that the D-guide comes out toward you, then turn it counterclockwise by pressing the ENT button then repeatedly pressing the 7 button lightly until the D-guide does not contact the disc rack (state of the turntable just before beginning to rotate).

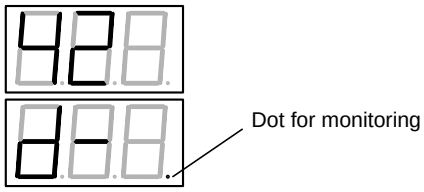
Caution : Depending on the location of the carriage base or the turntable, Manual Loading Operation may not be allowed. Every time you press the 7 or 9 button, make sure that you touch it very briefly.

(5) Watching through the rectangular hole on the left side of the disc stocker, check that there is no dislocation of a tooth or dislocation between the slits of the upper disc rack R and D-guide R and between the slits of the lower disc rack L and D-guide L.

6.3 SENSITIVITY ADJUSTMENT OF THE DISC DETECTION SENSOR OF THE CARRIAGE BASE

- Objective : Adjust the output of the phototransistor (light receiving side) with VR851 on the DCMB BOARD ASSY. (See Fig.4, page 74.) Refer to the dot on the lower right corner of the mode indicator for monitoring the sensor output.
- Preparation : Make the disc for adjustment available.
  Set the unit to Step Operation Mode (40 + ENT).

(1) Insert the disc for adjustment in the disc stocker, for example, into slot No.1 (f).
(2) Move the carriage base to the disc position (for example, 1 + ENT), and pull the disc into the carriage base (ENT).
(3) Monitor the dot. When the dot is lit, turn the half-fixed variable VR851 a little counterclockwise. When the dot is not lit, turn VR851 a little clockwise (h).



(4) Return the disc for adjustment to the disc stocker (ESC + ESC).
(5) Pull the disc back into the carriage base (ENT + ENT).
(6) Repeat steps (3) and (4) until the dot goes dark when it had been lit, or until the dot lights when it had been dark. Be sure that VR851 is fixed within ±10 degrees of the dot-lighting reverse point.

6.4 SENSITIVITY ADJUSTMENT OF THE DISC-OUT SENSOR

- Objective : Adjust the LED output (light emitting side) using VR101 of the HMCB UNIT. Set the threshold value of the sensor to match the transmission factor for the combination of the disc for adjustment and the filter for adjustment.
- Preparation : Make a disc and a filter for adjustment available.
  Remove the disc stocker.

(1) Set the disc for adjustment and the filter for adjustment together so that they block the optical axis of the LED (f), (g).
(2) Turn VR101 completely counterclockwise, then turn it clockwise little by little until the voltage of TP101 in relation to GND becomes 3.5 V ± 0.2 V (h).

Note : The setting value is indicated on the package of a disc for adjustment. If the indicated setting value is not 3.5 V, adjust VR101 until the voltage becomes the indicated value ± 0.2 V.

6.5 VOLTAGE ADJUSTMENT OF THE SW POWER OUTPUT

- Objective : Adjust the output using RV3 on the PWR BOARD ASSY (DWR1277).
- Preparation : Remove the rear cover. (See "PWR BOARD ASSY" of "Removal of Each Part," page 92.)

(1) Turn the power to the unit on.
(2) Turn RV3 until the difference in voltage between Pin 1 (+5 V) and Pin 2 (GND) of CN3 becomes +5.2 V ±0.05 V (h).

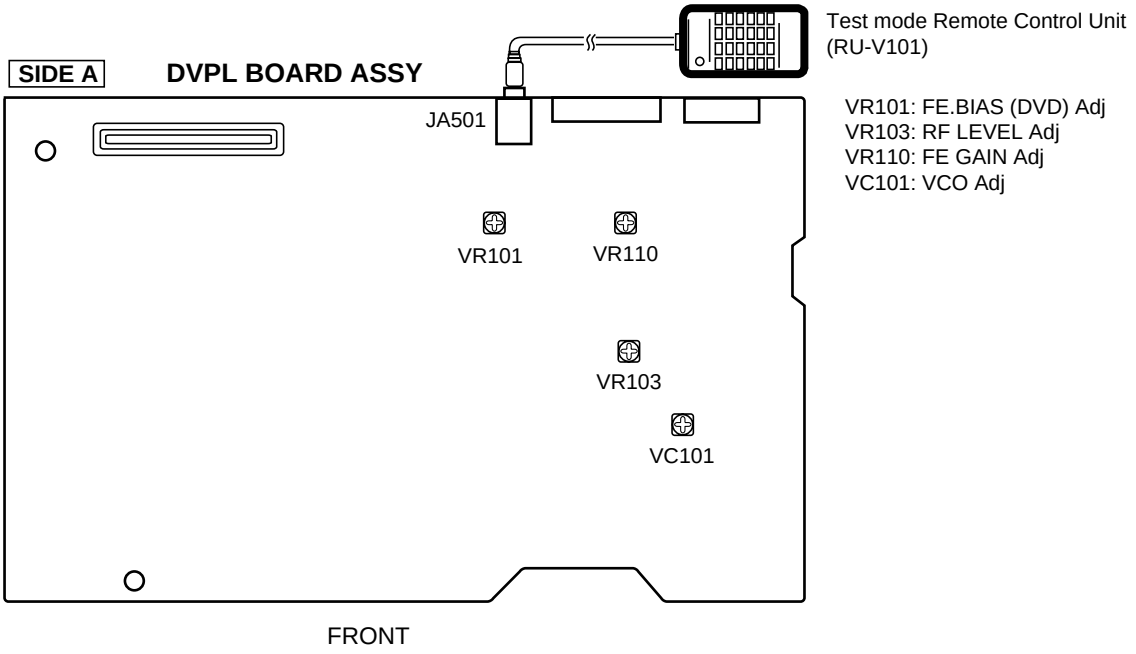
Note : This adjustment must be done only when the PWR BOARD ASSY (DWR1277) is replaced.

6.6 ADJUSTMENT OF DVD PLAYER SECTION

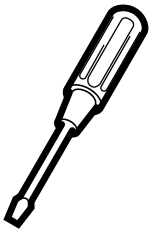
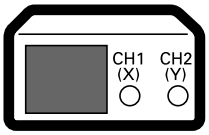
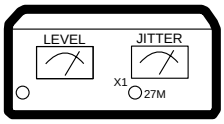
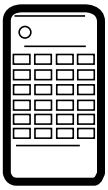
■ Adjustment Items

1. Focus Error Gain Adjustment
2. VCO Center Level Adjustment
3. Focus Error Bias (DVD) Adjustment
4. RF Level Adjustment

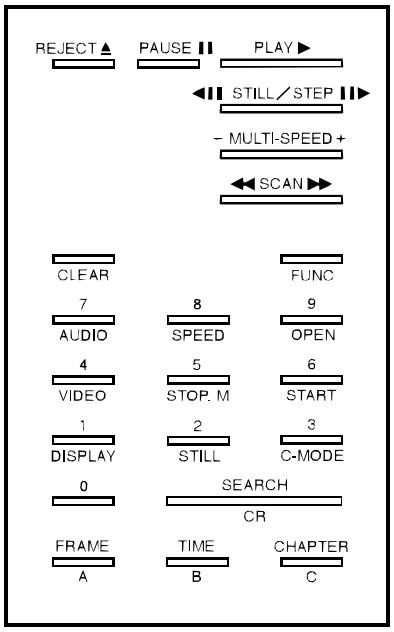
■ Adjustment and Measurement Locations



6.6.1 JIGS AND MEASURING INSTRUMENT

CD TEST DISC (STD–903)	DVD TEST DISC (MA1)	⊖ Precise screwdriver	 ⊖ screwdriver (small)	⊕ screwdriver (medium)
⊕ screwdriver (large)	 Dual-trace oscilloscope (10 : 1 probe)	 Jitter Meter	 Test mode Remote Control Unit (RU-V101)	

● Function Table of the Remote Controller (RU-V101) for Service



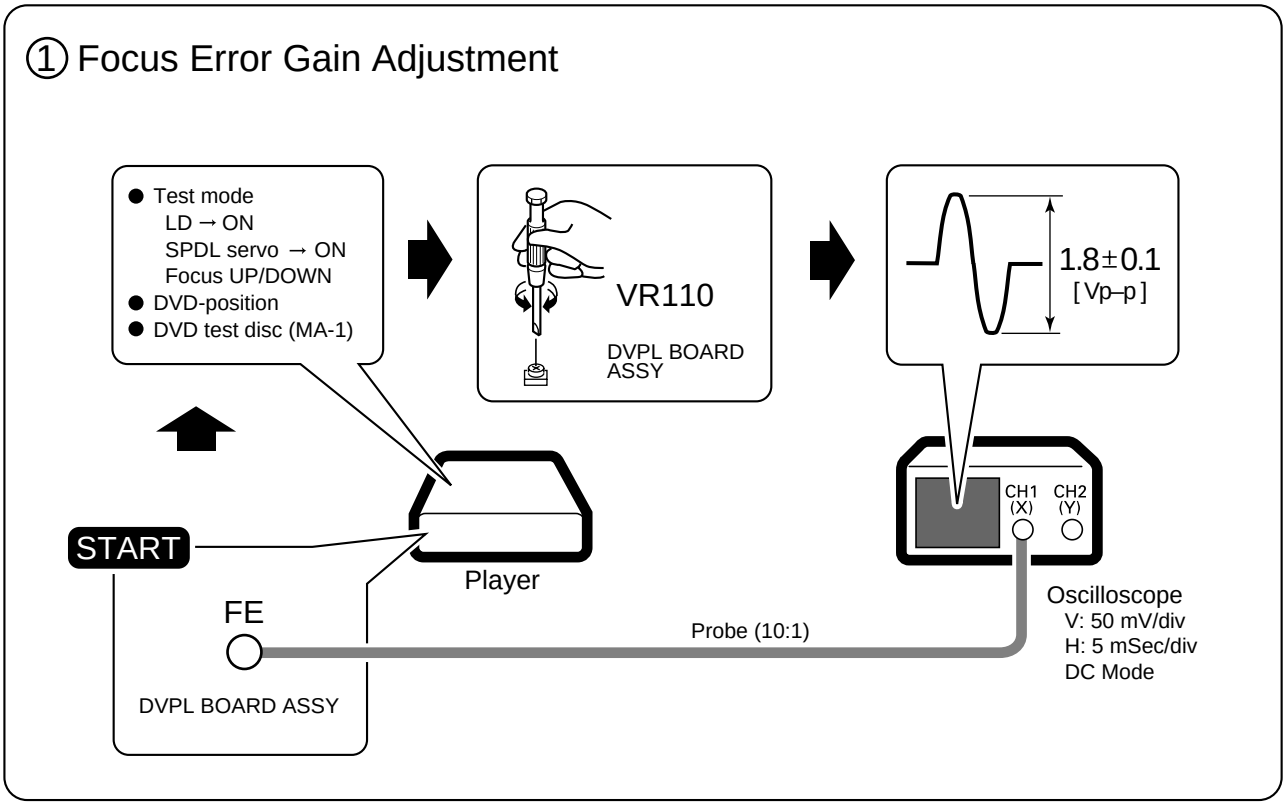
RU-V101

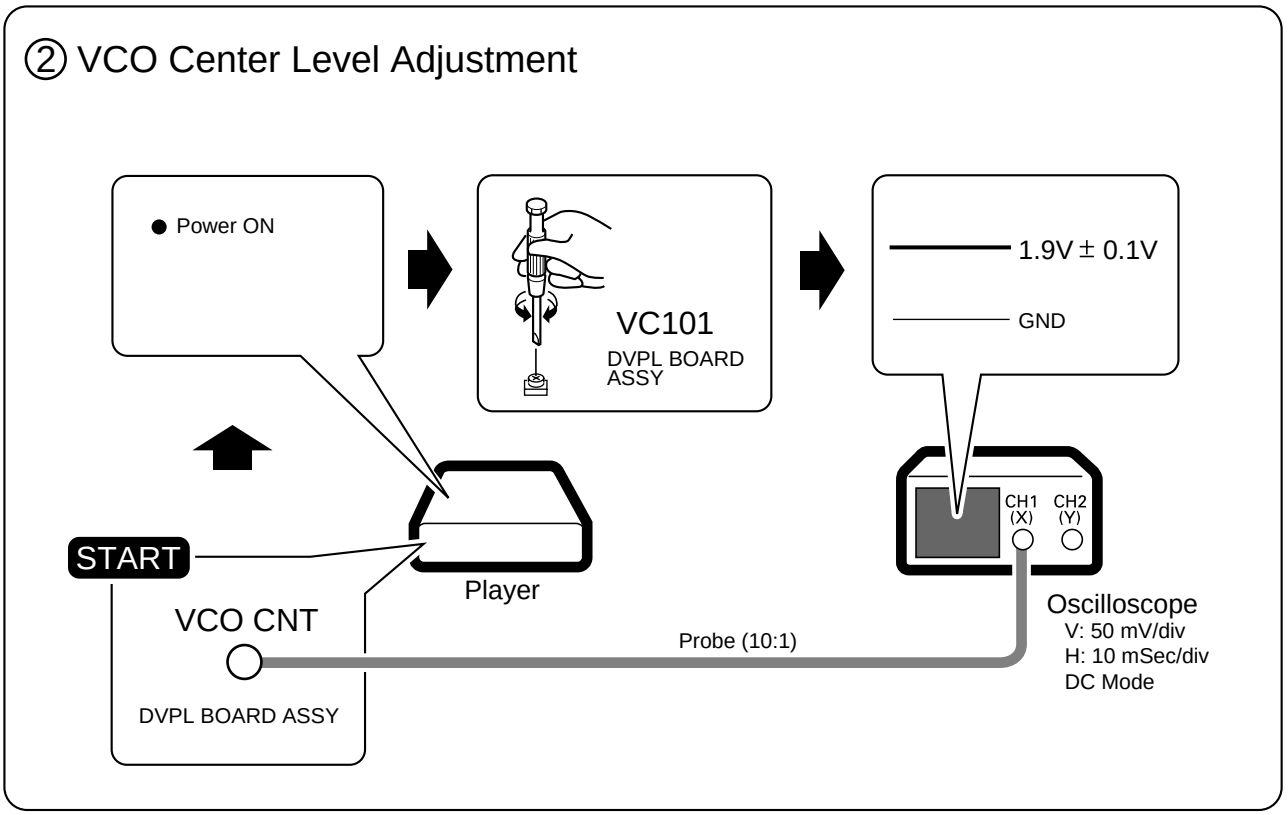
REJECT		: Spindle stop
PAUSE		: Pause
PLAY		: Play
STILL/STEP	❚❚▶	: ⎫ Test command
STILL/STEP	◀❚❚	: ⎭
MULTI-SPEED +		: ⎫ Test command
MULTI-SPEED –		: ⎭
SCAN	▶▶	: No entry
SCAN	◀◀	: No entry
CLEAR		: Clear
FRAME		: Frame set
TIME		: Time set
CHAPTER		: Track set
SEARCH		: Search
10 key		: Numerical input
DISPLAY	(FUNC + 1)	: No entry
STILL	(FUNC + 2)	: No entry
C-MODE	(FUNC + 3)	: No entry
VIDEO	(FUNC + 4)	: No entry
STOP. M	(FUNC + 5)	: No entry
START	(FUNC + 6)	: Start
AUDIO	(FUNC + 7)	: No entry
SPEED	(FUNC + 8)	: No entry
OPEN	(FUNC + 9)	: open

● Test command

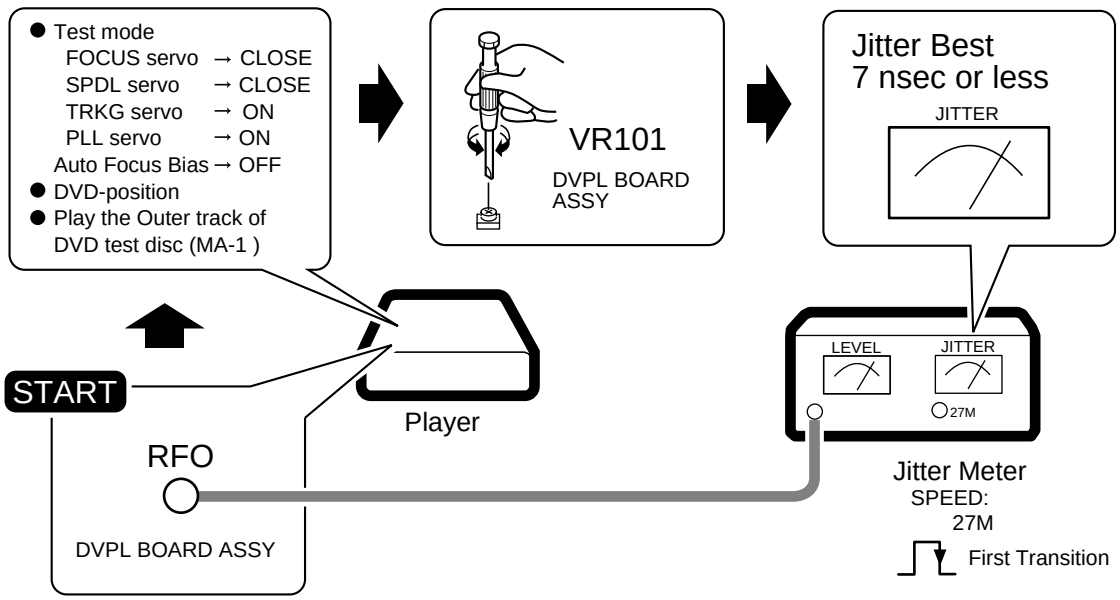
Key Operation	Command	Description
● CD Position		
[0] + [TIME]	{0TM}	All servo OFF
[1] + [TIME]	{1TM}	Laser-diode (LD) ON
[2] + [TIME]	{2TM}	Focus ON/OFF
[3] + [TIME]	{3TM}	Spindle ON
[4] + [TIME]	{4TM}	Tracking ON / OFF
[5] + [TIME]	{5TM}	PLL ON / OFF
[6] + [TIME]	{6TM}	Focus Up / Down
[8] + [TIME]	{8TM}	Spindle rotation control : CAV control
[9] + [TIME]	{9TM}	Spindle rotation control : CLV control
● DVD Position		
[1] + [0] + [TIME]	{10TM}	All servo OFF
[1] + [1] + [TIME]	{11TM}	Laser-diode (LD) ON/OFF
[1] + [2] + [TIME]	{12TM}	Focus Servo ON
[1] + [3] + [TIME]	{13TM}	Spindle FG ON
[1] + [4] + [TIME]	{14TM}	Tracking ON/OFF
[1] + [5] + [TIME]	{15TM}	Spindle PLL ON / OFF
[1] + [8] + [TIME]	{18TM}	Slider FWD move
[1] + [9] + [TIME]	{19TM}	Slider REV move
[3] + [3] + [TIME]	{33TM}	Focus Up / Down
[4] + [3] + [TIME]	{43TM}	CD Position
[4] + [4] + [TIME]	{44TM}	DVD Position
[4] + [7] + [TIME]	{47TM}	Auto Focus Bias Adjustment OFF
[4] + [8] + [TIME]	{48TM}	Auto Focus Bias Adjustment ON
[STILL/STEP >>]	{SF}	1 Track jump : FWD
[STILL/STEP <<]	{SR}	1 Track jump : REV
[*] + [*] + [*] + [MULTI-SPEED +]	{***MF}	*** Track jump : FWD
[*] + [*] + [*] + [MULTI-SPEED –]	{***MR}	*** Track jump : REV

6.6.2 ADJUSTMENT

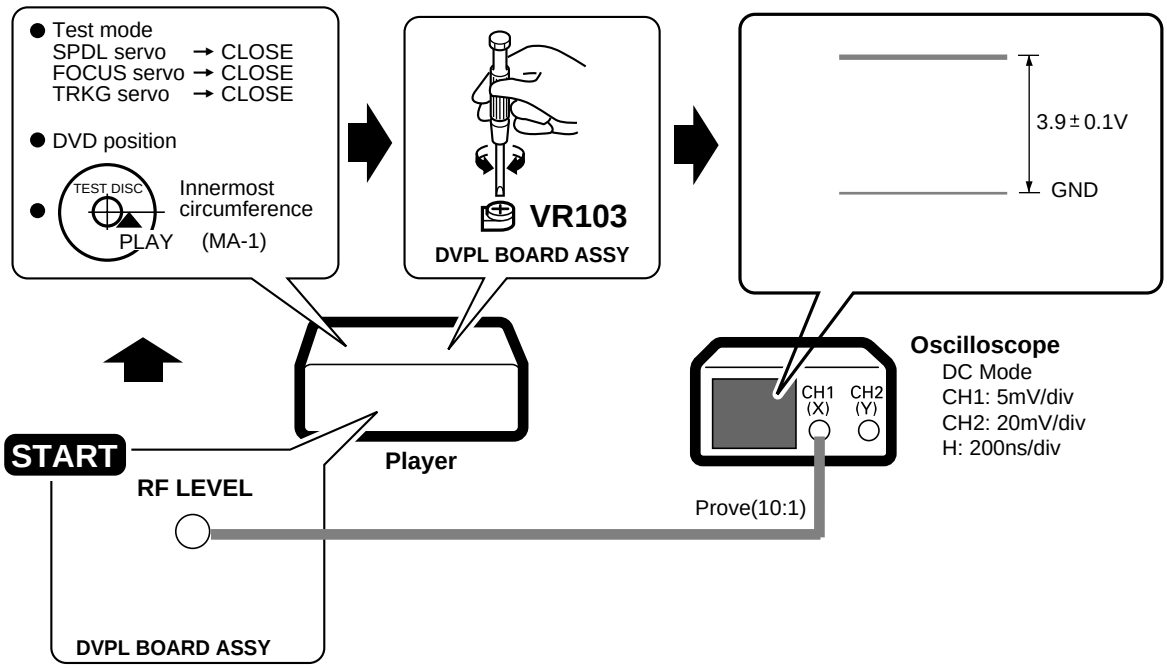




③ Focus Error Bias (DVD) Adjustment



④ RF Level Adjustment



7. GENERAL INFORMATION

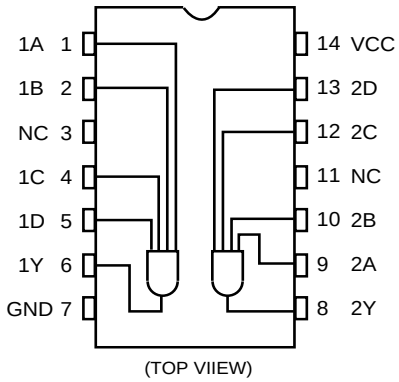
7.1 IC

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ TC74VHC21FT
(IC121: DECB BOARD ASSY)

● Dual 4-Input AND Gate

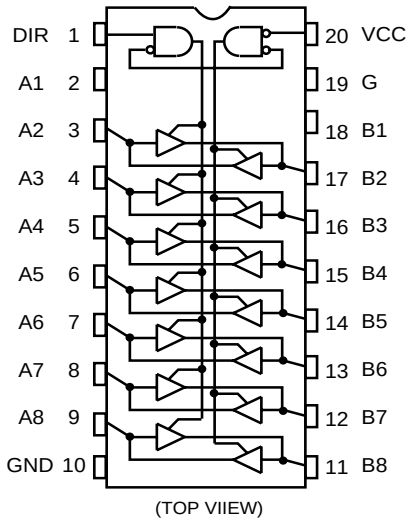
● Pin Assignment (Top view)



■ TC74HCT245AF
(IC307: DVPL BOARD ASSY)

● Octal Bus Transceiver

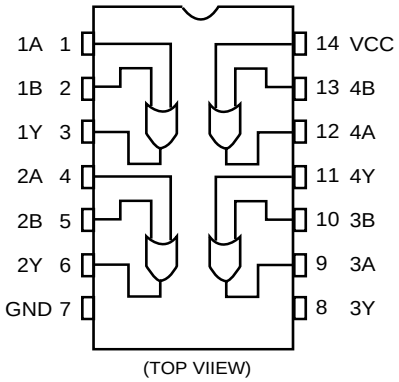
● Pin Assignment (Top view)



■ TC74VHC32FT
(IC115,IC117: DECB BOARD ASSY)

● Quad 2-Input OR Gate

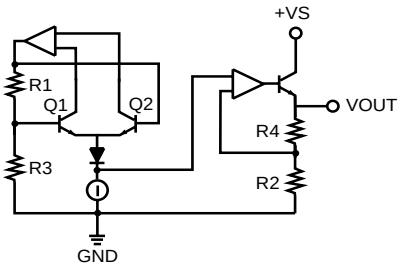
● Pin Assignment (Top view)



■ LM35DZ
(IC901: SNSB BOARD ASSY)

● Temperature Sensor

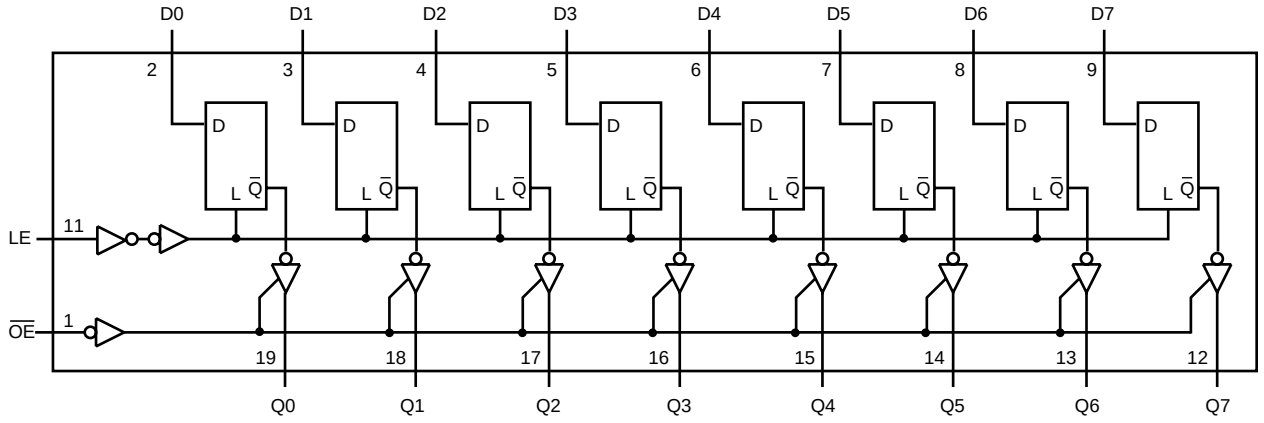
● Block Diagram



■ TC74VHCT573AFT (IC110, IC113: DECB BOARD ASSY)

● Octal D-Type Latch With 3-State Output

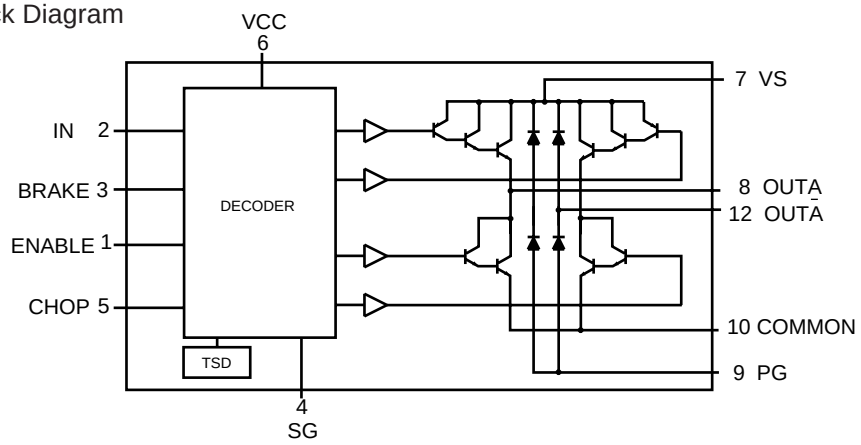
● Block Diagram



■ TA8440H (IC114: HMCB BOARD ASSY)

● Bridge Driver IC

● Block Diagram



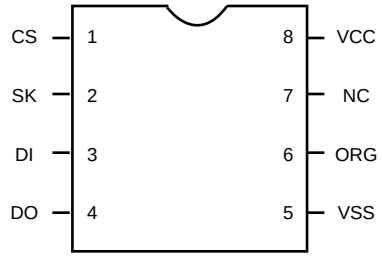
● Pin Function

No.	Pin Name	Description
1	ENABLE	Enable Terminal
2	IN	FWD/ REV Change Terminal
3	$\overline{\text{BRAKE}}$	Blake Terminal
4	SG	Signal Ground
5	$\overline{\text{CHOP}}$	PWM Signal Terminal
6	VCC	Control Power Terminal
7	VS	Output Power Terminal
8	OUTA	Output Terminal
9	PG	Power Ground
10	COMMON	Common Terminal
11	PG	Power Ground
12	OUTA	Output Terminal

■ NM93C86AEM8 (IC108: HMCB BOARD ASSY)

● CMOS EEPROM

● Pin Assignment (Top view)

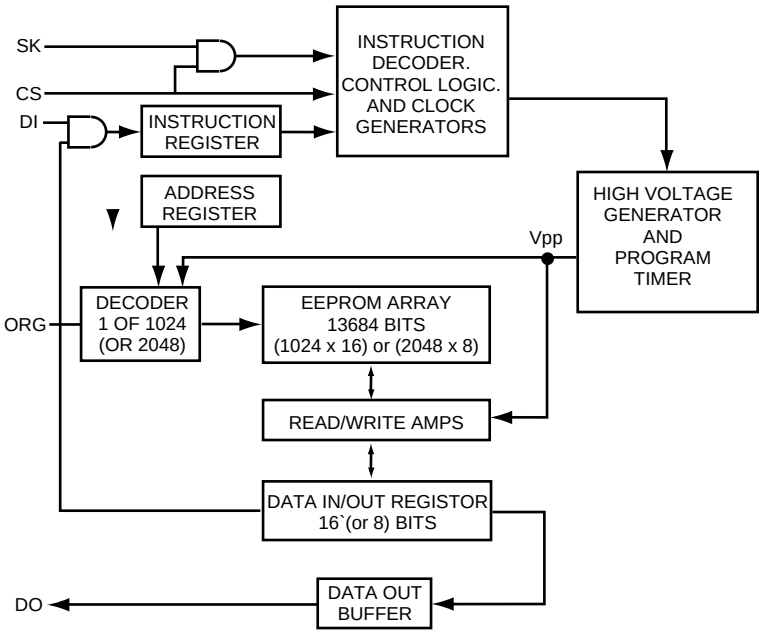


(TOP VIEW)

● Pin Function

No.	Pin Name	Description
1	CS	Chip Select
2	SK	Serial Data Clock
3	$\overline{DI}$	Serial Data Input
4	DO	Serial Data Output
5	$\overline{VSS}$	Ground
6	ORG	Memory Oraganization Selct
7	NC	No Vonnect
8	VCC	Power Supply

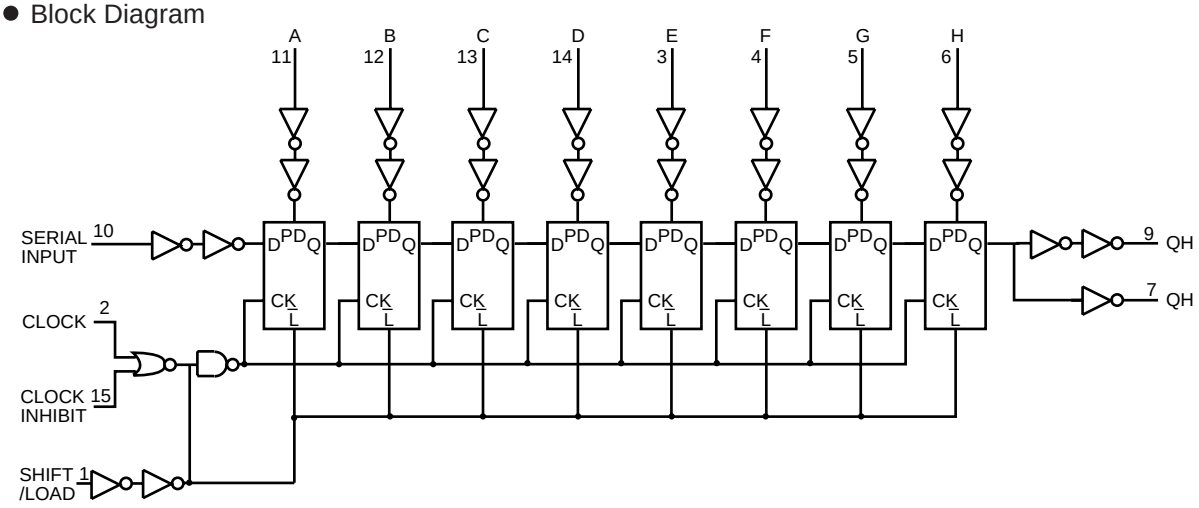
● Block Diagram



■ TC74HC165AF (IC105: HMCB BOARD ASSY)

● 8-BIT Sift Register

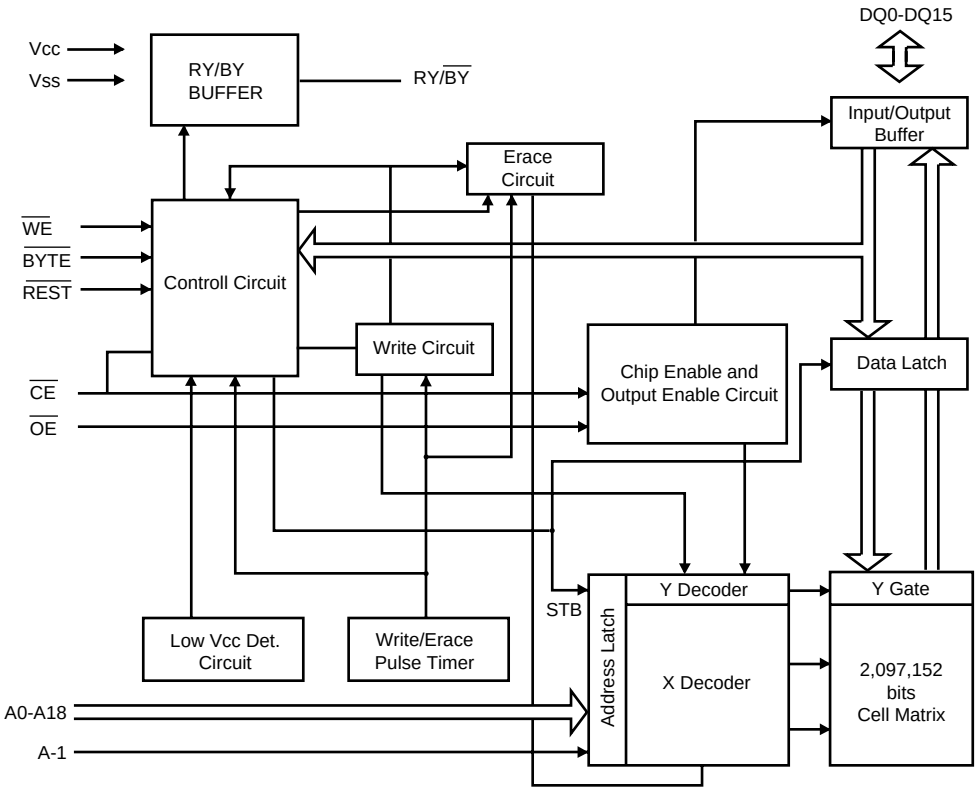
● Block Diagram



■ DYW1606 (IC1020: HMCB BOARD ASSY)

● Flash Memory IC

● Block Diagram



● Pin Function

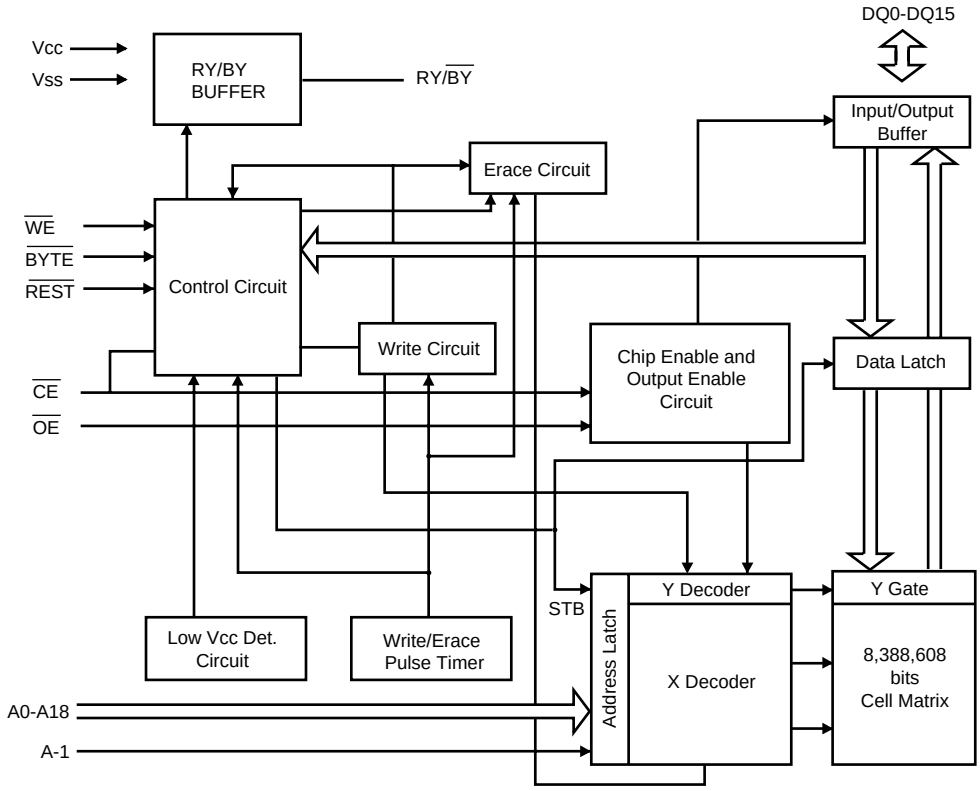
No.	Pin Name	Description
1	N.C	——
2	RY/BY	RY/BY Output
3	N.C	——
4	A7	Address Input Terminal
5	A6	
6	A5	
7	A4	
8	A3	
9	A2	
10	A1	
11	A0	
12	CE	Chip Enable
13	Vss	Ground
14	OE	Output Enable
15	DQ0	Data Input/Output Terminal
16	DQ8	
17	DQ1	
18	DQ9	
19	DQ2	
20	DQ10	
21	DQ3	
22	DQ11	

No.	Pin Name	Description
23	Vcc	+5V Power-Supply
24	DQ4	Data Input/Output Terminal
25	DQ12	
26	DQ5	
27	DQ13	
28	DQ6	
29	DQ14	
30	DQ7	
31	DQ15	
32	Vss	Ground
33	BYTE	8bit , 16bit Mode Select
34	A16	Data Input/Output Terminal
35	A15	
36	A14	
37	A13	
38	A12	
39	A11	
40	A10	
41	A9	
42	A8	
43	WE	Write Enable
44	RESET	Reset

■ DYW1608 (IC1030: DECB BOARD ASSY)

● Flash Memory IC

● Block Diagram



● Pin Function

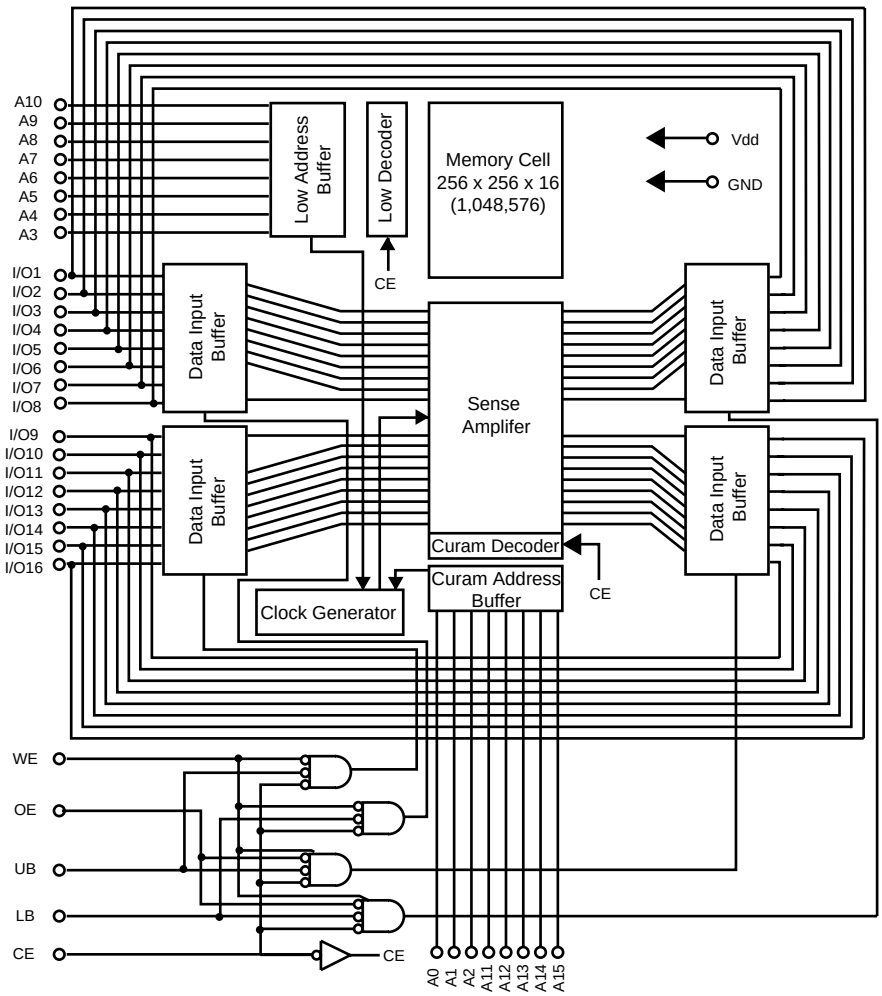
No.	Pin Name	Description
1	RY/BY	RY/BY Output
2	A18	——
3	A17	——
4	A7	Adders Input Terminal
5	A6	
6	A5	
7	A4	
8	A3	
9	A2	
10	A1	
11	A0	
12	CE	Chip Enable
13	Vss	Ground
14	OE	Output Enable
15	DQ0	Data Input/Output Terminal
16	DQ8	
17	DQ1	
18	DQ9	
19	DQ2	
20	DQ10	
21	DQ3	
22	DQ11	

No.	Pin Name	Description
23	Vcc	+5V Power-Supply
24	DQ4	Data Input/Outpur Terminal
25	DQ12	
26	DQ5	
27	DQ13	
28	DQ6	
29	DQ14	
30	DQ7	
31	DQ15	
32	Vss	Ground
33	BYTE	8bit , 16bit Mode Select
34	A16	Data Input/Output Terminal
35	A15	
36	A14	
37	A13	
38	A12	
39	A11	
40	A10	
41	A9	
42	A8	
43	WE	Write Enable
44	RESET	Reset

■ TC551664BJ-15 (IC105: DECB BOARD ASSY)

● CMOS RAM

● Block Diagram



● Pin Function

No.	Pin Name	Description
1 I 5	A4 I A0	Address Input
6	CE	Chip Enable
7 I 10	I/O1 I I/O10	Data Input/Output
11	VDD	+5V Power-Supply
12	GND	Ground
13 I 16	I/O5 I I/O8	Data Input/Output
17	WE	Write Enable
18 I 21	A15 I A12	Address Input
22	N.C	—

No.	Pin Name	Description
23	N.C	—
24 I 27	A11 I A10	Address Input
28	N.C	—
29 I 32	I/O9 I I/O12	Address Input
33	VDD	+5V Power-Supply
34	GND	Ground
35 I 38	I/O13 I I/O16	Address Input
39	LB	Data Bit Control
40	UB	Data Bit Control
41	OE	Output Buffer Control
42 I 44	A7 I A5	Address Input

7.2 DIAGNOSIS

7.2.1 DISASSEMBLY

■ For safety

Be careful not to pinch your fingers by the moving carriage base. Also be careful not to cut your hands on burrs of the sheet metal of the chassis, etc.

■ Warnings during service

(1) Carriage Base disc sensor

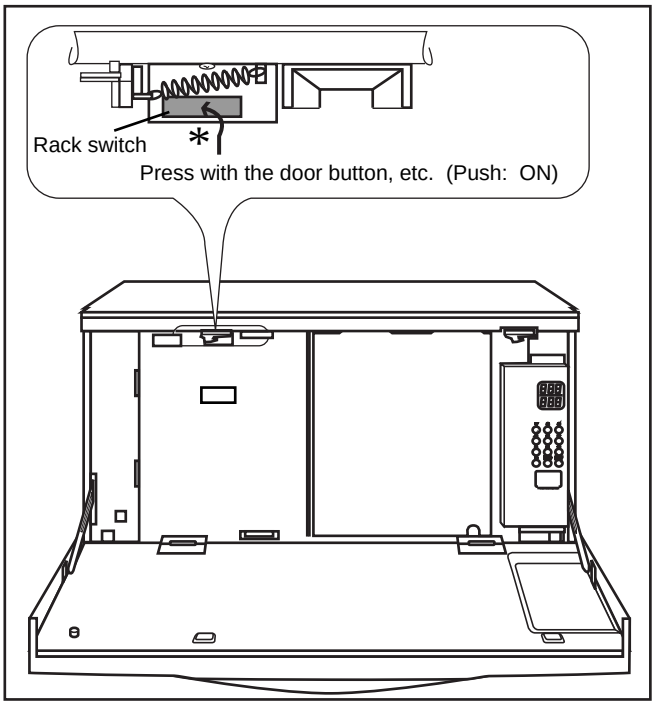
The Carriage Base of this unit senses discs optically.
In a case of servicing with the housing removed, if a strong light is shed from the top of the carriage base, disc sensing may become disabled.

(2) Electrostatic destruction

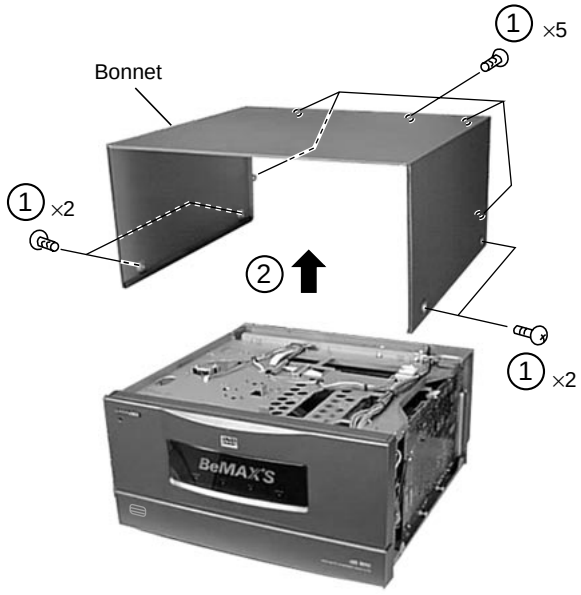
If you handle a circuit board by hand during servicing, such as when repairing the unit or attaching an expansion drive, be careful not to destroy the Pickup or ICs with static electricity.

(3) Rack switch

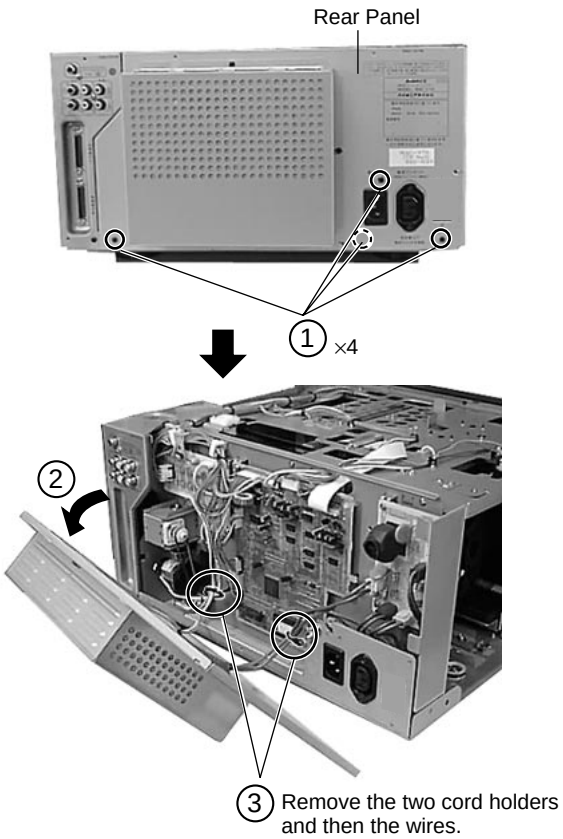
The electric current for drive circuits of the Horizontal Motor and Loading Motor on the Carriage Base is cut for safety while the disc Stocker is removed (while the Rack Switch is not pressed).
If it is necessary to operate these motors forcibly during servicing, press the part marked with an asterisk (*) in the illustration below with the Door Key, etc., to set the Rack switch to ON.



■ **Bonnet**

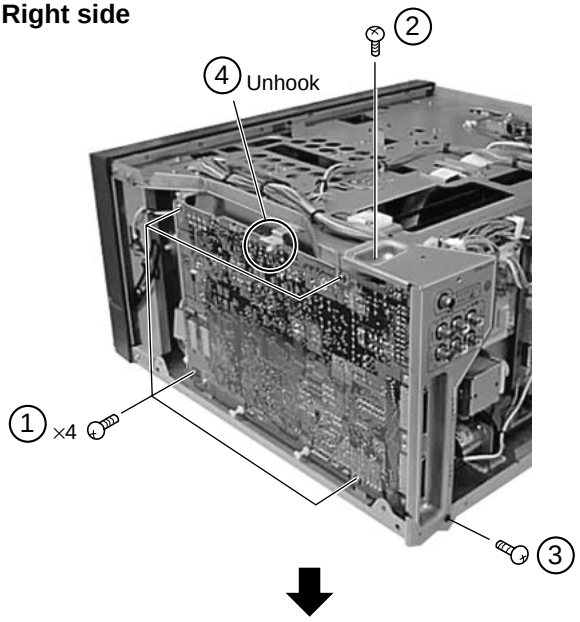


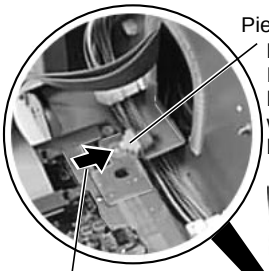
■ **Rear**



Note : Do NOT pull wires forcibly. Doing so may damage the packing of the rear panel.

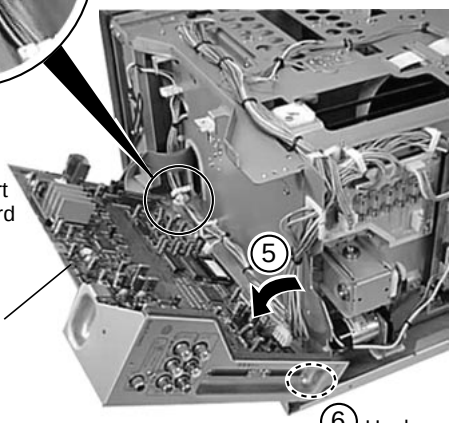
■ Right side





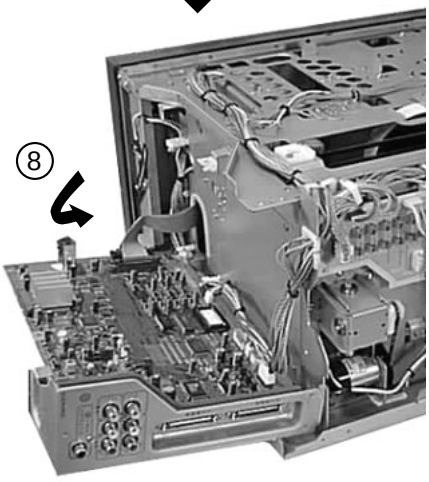
Pierce Hold

Note : When removing the DECB BOARD ASSY, widen the pierce hold. If you remove the board forcibly without widening the pierce hold, the board may be cracked.



Note :
Insert into the part of the DECB board marked "Clamp."

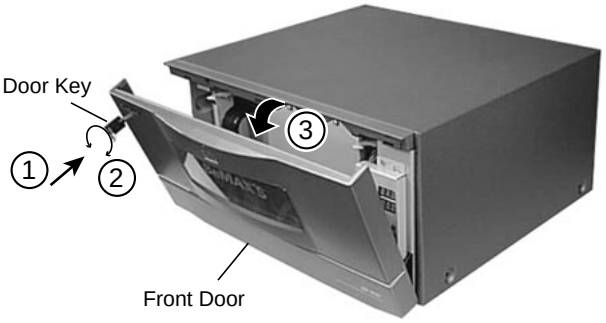
DECB BOARD ASSY



■ Opening the front door

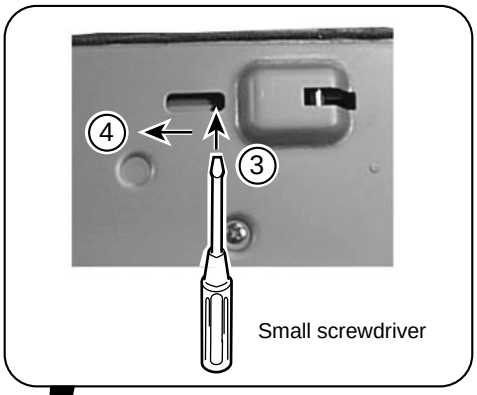
There are two ways to open the front door for servicing when an error occurs.

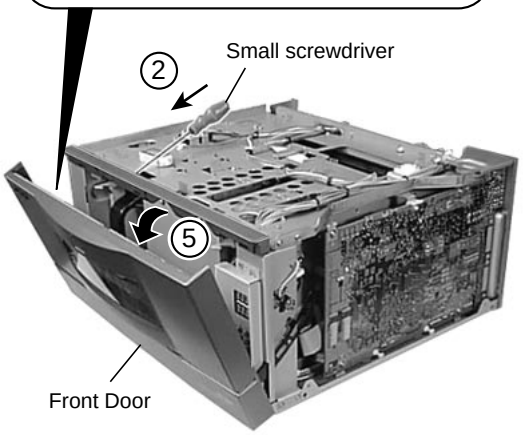
1. With the door key



2. When the lock mechanism is out of order, or to open without the door key (forced opening)

(1) Remove the bonnet. (See page 89.)

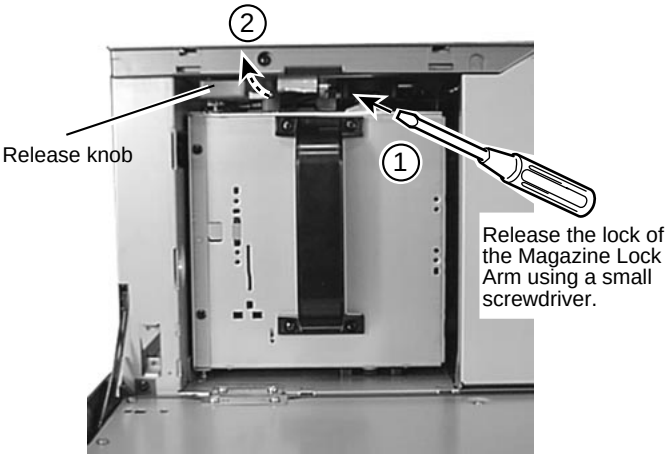


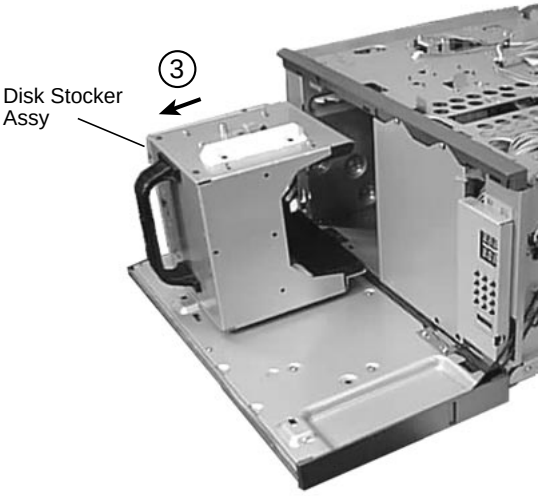


■ Disk Stocker Assy

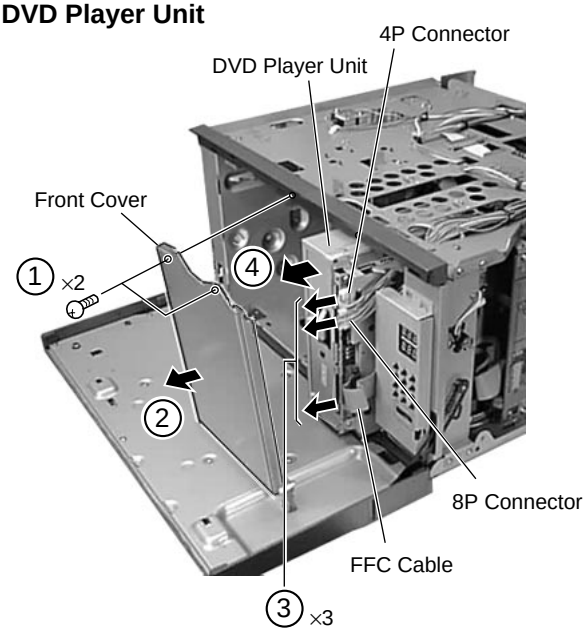
1. Manual mode (when the power is off)

Note: Because the Disc Stocker Assy is locked by a plunger while the power is off, it cannot be removed by pressing the release knob.

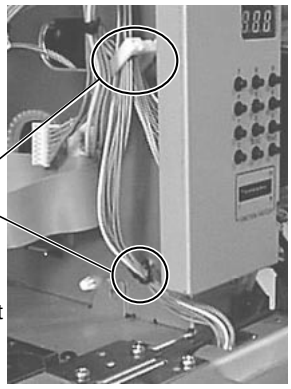




■ DVD Player Unit

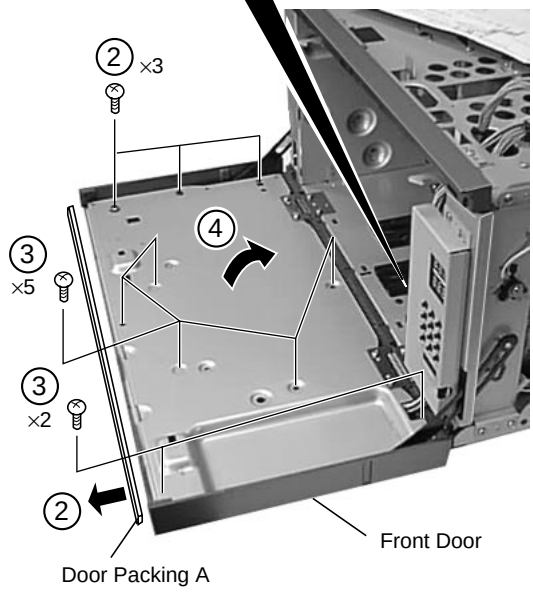


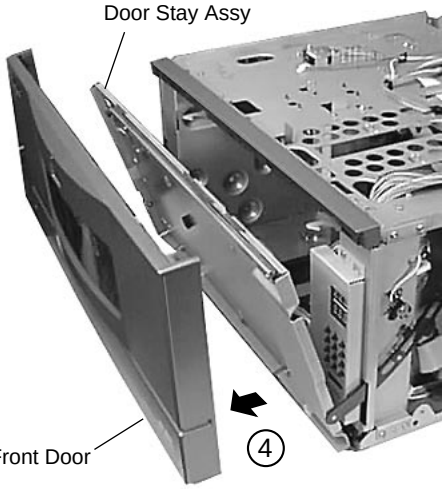
■ Front Door



① Remove the wires.

Note:
When attaching the player, the front door can be removed without this step.

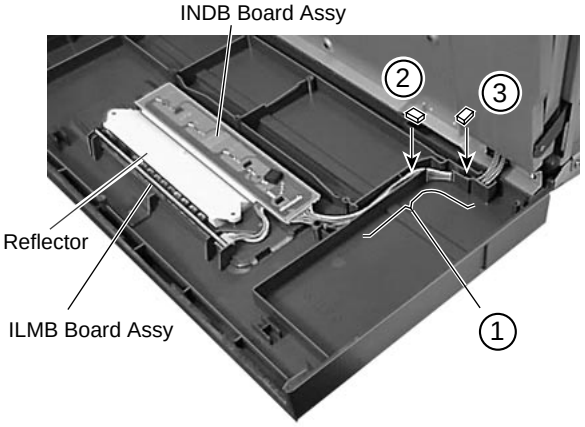




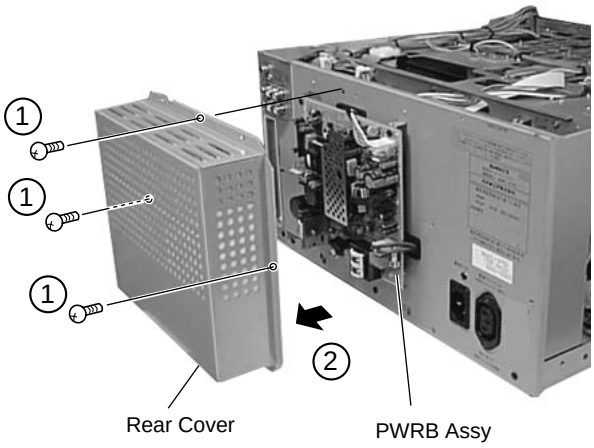
● Attaching the front door

Lay out the wires as illustrated below and fix them with two cushions.

Notes:
- Be careful not to pinch the wires.
- The Reflector is attached with the same screws as the Door Stay.

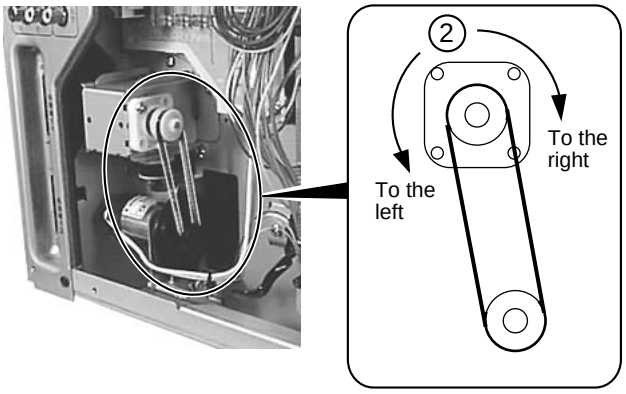


■ PWR BOARD ASSY



■ How to move the Carriage Base manually to the right and left

① Remove the rear panel (see page 89).



■ Maintenance of the Carriage Base

(1) Removing the Chuck Assy

1. Move the Carriage Base to the approximate center of the Disc Stocker (approx. [25]).
2. Turn off the power.
3. Slide the Chuck toward you by rotating the Loading Motor.
4. Lifting up the Upper Plate, pull the Chuck Assy from the shaft of the Planetary Arm.

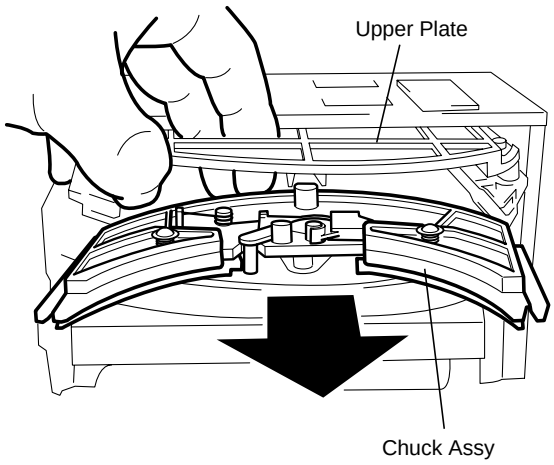


Fig. 1

(2) Removing the Swing-full Assy

1. Move the Carriage Base to the leftmost position ([1]).
2. Turn off the power.
3. Remove two fixing screws ① and remove the Sensor Stay.

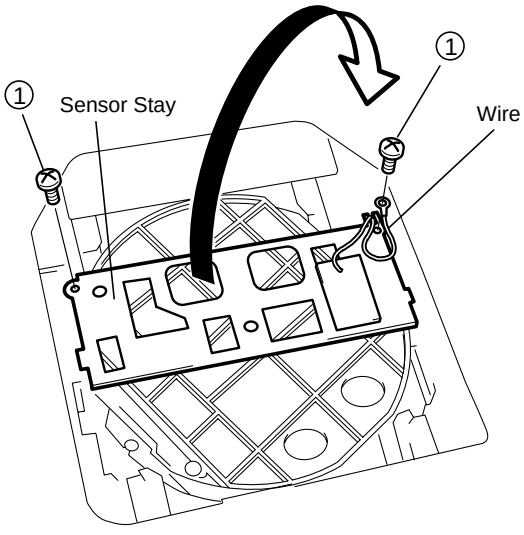


Fig. 2

Note : Make sure not to damage the wire. Also, be sure to remember the layout of the wire before removing.

4. Unlock the Lock Plate by sliding the plate with its side lifted.

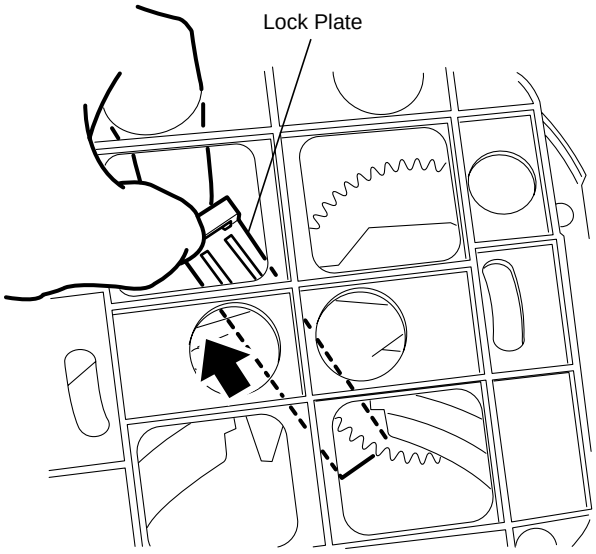


Fig. 3

5. Grip the Chuck Assy and the Upper Plate together so that the Chuck Assy will not move, and pull them out toward you.

Note : Pull out the Chuck Assy and the Upper Plate slowly straight toward you so that the Steel Ball will not fall. After pulling them out, remove the Steel Ball.

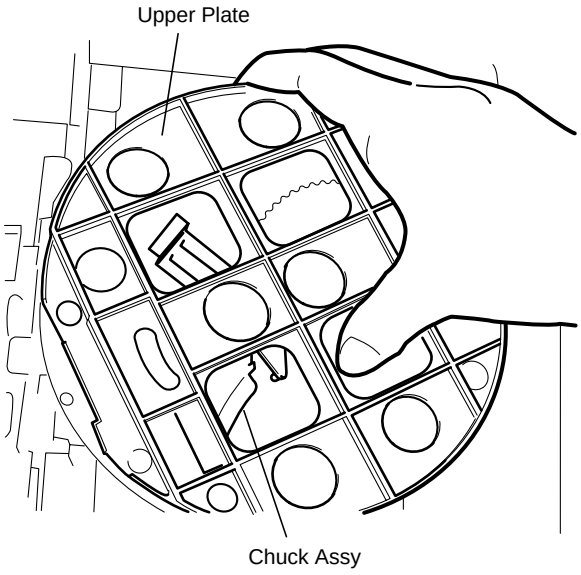


Fig. 4

(3) Attaching the Inner Table Assy

1. Mount the Inner Table Assy so that the tip of the Planetary Arm Assy is centered on the cutout of the Outer Table.

Note : Make sure that the Inner Table Assy is not mounted on the flange of the Outer Table.

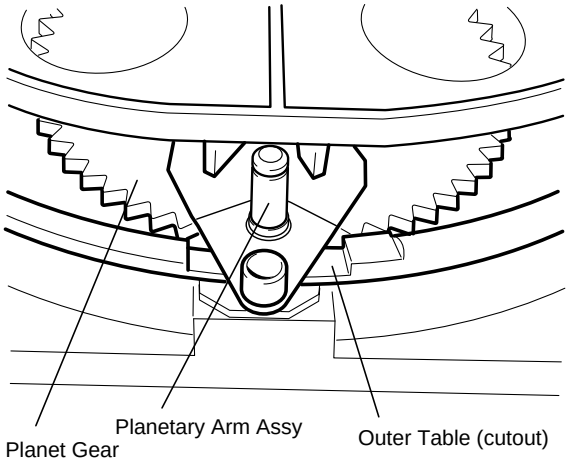


Fig. 5

(4) Mounting the Swing-full Assy

1. Place the unit in the upright position with the left side of the unit up (right side down). Use a soft cloth such as a rug to protect the Front Door.
2. Align the largest, key-shaped axis of the H Cam Gear of the Carriage Base and two SW Arms C with the ▲ marks.
3. Turn the Inner Table of the Swing-full Assy completely counterclockwise and keep it in that position.

Note : Grip the Chuck Assy and the Upper Plate firmly so that the Inner Table will not return to its original position under its spring tension.

4. Insert the Steel Ball into the slot of the Outer Plate.
5. Align the key-shaped slot of the Inner Plate with the key-shaped axis of the H Cam Gear, and mount the Swing-full Assy.

Note : While mounting the Inner Table, press it on so that the Inner Table will not pop up from the Outer Plate.

6. Slide the Lock Plate, and lock it.

Note : Check that the Lock Plate is firmly locked by lifting the Swing-full Assy.

7. Rotate the Swing-full Assy one turn by rotating the Loading Motor. If the SW C Arms are not seated in the cam grooves, the rotation will be locked midway. In such a case, remove the Swing-full Assy and repeat steps 5 through 7.
8. Lay out the wire of the Sensor Stay and screw on the Sensor Stay.

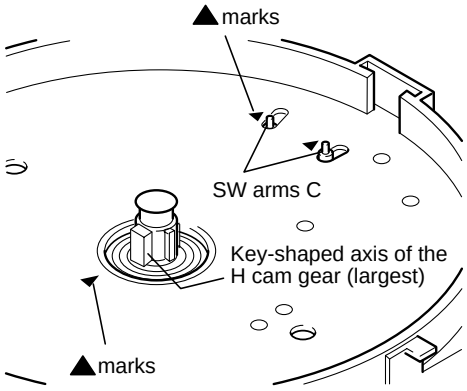


Fig. 6

(5) Removing the Rear Panel

1. Remove the right panel of the unit (see page 90).
2. Remove the two screws and remove the Under Plate.
3. Remove parts as required.

Note : Changing the H Cam Gears must be done with the Swing-full Assy removed.

(6) Attaching the SW Arms

1. Attach the SW Arms as indicated in Fig. 7.

Note : There are three SW Arms, labeled A, B and C.

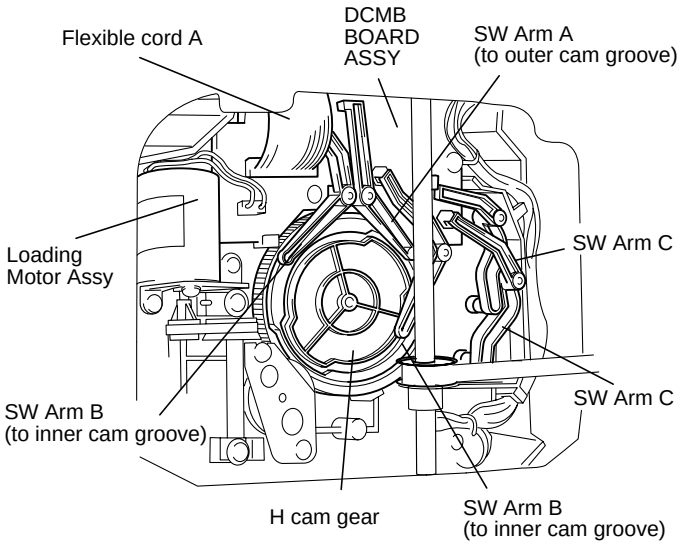


Fig. 7

7.2.2 SERVICE MODE

• Service mode by Function Button operation

This is the service mode mainly for the disc-changer mechanism, and to be used for confirmation of error history and maintenance information, adjustment of mechanisms, and aging. For details, see "(1) List of Buttons Function in Service Mode".

• Service mode using the remote control for service use

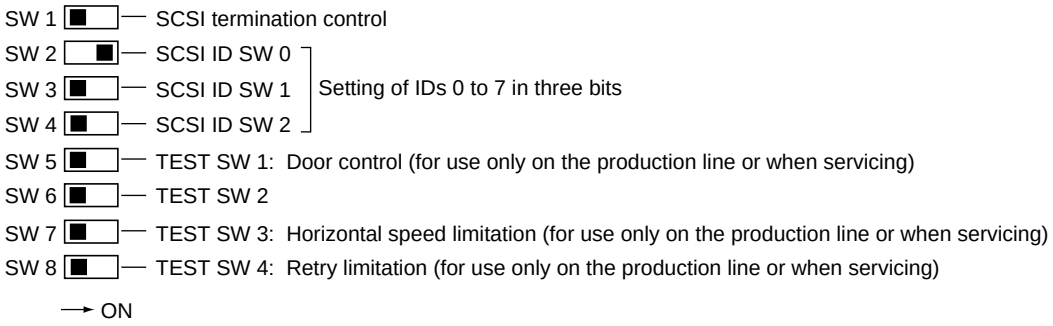
This is the service mode to operate the changer system from the RU-V101 connected during servicing. For details, see "(13) Service mode operated from a remote control."

• Service mode for the built-in player only

This is the service mode to adjust and operate the player from the RU-V101 connected directly to the player.

• Function switches

The operation mode can be selected by setting the function switches.
Factory preset positions: ON for Switch 2 and OFF for all the other switches.


SW 1
SCSI termination control
SW 2
SCSI ID SW 0
SW 3
SCSI ID SW 1
SW 4
SCSI ID SW 2
Setting of IDs 0 to 7 in three bits
SW 5
TEST SW 1: Door control (for use only on the production line or when servicing)
SW 6
TEST SW 2
SW 7
TEST SW 3: Horizontal speed limitation (for use only on the production line or when servicing)
SW 8
TEST SW 4: Retry limitation (for use only on the production line or when servicing)
ON

∗ **Switches 5 to 8 are to be used for maintenance and repair of the mechanisms.**

• Door control

When SW 5 is set to ON, the unit recognizes that the door is closed regardless of the actual door status. Use when you wish to operate the unit by checking the inside indications during aging mode, etc. Normally, keep the switch set to OFF.

• Horizontal speed limitation

Use SW 7 during maintenance or repair of the horizontal-movement mechanism of the carriage. When this switch is set to ON, acceleration is prohibited, and horizontal operation is performed at the lowest speed. Normally keep the switch set to OFF.

• Retry limitation

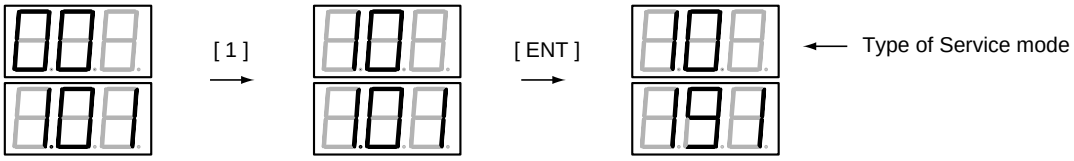
When SW 8 is set to ON, retry of a loading mechanism operation is limited. Normally keep the switch set to OFF.

(1) List of Buttons Function in Service Mode

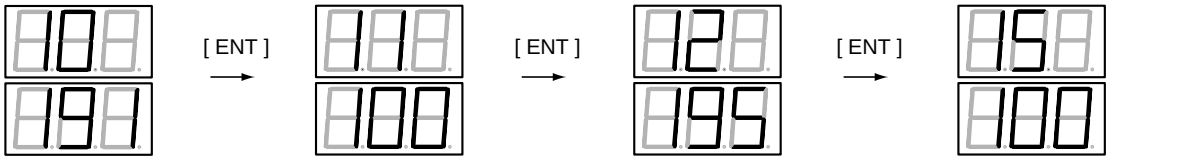
Mode	Operation / Function	Function of Numeric Buttons	Function of ENT Button	Function of ESC Button
00	Indication of version and serial No.	Selection of Test mode.	Move to other mode	Quit Service mode
10	Reference changer error history	With the [7] and [9] buttons,	Proceed to Mode #11	Return to Mode #00
11	Reference player #1 error history	select an error history.	Proceed to Mode #12	Return to Mode #00
12	Reference player #2 error history	Selection of 1 to F.	Proceed to Mode #15	Return to Mode #00
15	Reference decoder error history	Ascending direction: [7] button, descending direction: [9] button	Proceed to Mode #10	Return to Mode #00
20	Indication of total power-on hours		Proceed to Mode #21	Return to Mode #00
21	Indicate playback hours of player #1	Toward MSB: [7] button,	Proceed to Mode #22	Return to Mode #00
22	Indicate playback hours of player #2	toward LSB: [9] button	Proceed to Mode #25	Return to Mode #00
25	Indicate iterations of disc setting		Return to Mode #20	Return to Mode #00
30	Set serial No.	Select numerics with the [7] and [9] buttons, alphabetics with the [1] and [3] buttons	Hold [ENT] button pressed for 4 seconds to register input (Modes #30 and #31	Return to Mode #00
31	Set model name code	Select numerics with the [1] and [3] buttons	appear alternately)	Return to Mode #00
40	Step carriage movement	Address input	Movement in the plus direction	Movement in the minus direction
50	Manual horizontal operation	Left: [7] button, right: [9] button	Proceed to Mode #51	Return to Mode #00
51	Manual loading operation	Counterclockwise: [7] button, Clockwise: [9] button	Proceed to Mode #52	Return to Mode #00
52	Manual clamp operation	Open: [7] button, close: [9] button, select player No: [1] or [2] button	Return to Mode #50	Return to Mode #00
60	Indicator check	Invalid	Proceed to Mode #61	Return to Mode #00
61	Function button check	Indicate the button pressed	Proceed to Mode #62	Return to Mode #00
62	Check for existence of disc stocker	Invalid	Return to Mode #60	Return to Mode #00
70	Aging mode with number designation (Mode A)	Invalid	Start executing	Stop; return to #00
71	Aging mode with hour designation (Mode B)	Invalid	Start execution	Stop; return to #00
72	Aging mode with full mounting (Mode C)	Invalid	Start execution	Stop; return to #00
73	Time setting for Mode #71	Time input (max.: 99 h)	Register input	Cancel; return to #00
74	Number setting for Mode #70	Number input (max.: 999)	Register input	Cancel; return to #00
75	Start address setting	Start address input	Register input	Cancel; return to #00
80	Clear all changer error history	During Mode #00, hold [ENT] button pressed for about 4 sec. to enter "8." Press a numeric button to select the submode, then press the [0] and [ENT] buttons simultaneously and hold for 4 sec. to execute.		Return to Mode #00
81	Clear all player #1 error history			Return to Mode #00
82	Clear all player #2 error history			Return to Mode #00
85	Clear all decoder error history			Return to Mode #00
86	Clear all disc-move addresses			Return to Mode #00
89	Clear all information of Modes #80 to #86			Return to Mode #00
91	Clear player #1 playback hours	During Mode #00, hold the [9] button pressed for about 4 seconds to enter Mode 9. Press a numeric button to select the submode, then press [0] and [ENT] simultaneously and hold for 4 seconds to execute.		Return to Mode #00
92	Clear player #2 playback hours			Return to Mode #00
95	Clear iterations of disc setting			Return to Mode #00

(2) Operations in Service Mode

To enter Service mode, press the [0] and [ENT] buttons simultaneously and hold for about 4 seconds until the mode indicator lights.
Each service mode is expressed by two-digit number, the mode type by the left-hand digit (0 to 8). The meaning of the right-hand digit (submode) differs according to the mode.
The initial mode is Mode #0, version indication mode. To enter a desired mode, enter the mode number by pressing a numeric button, then press the [ENT] button. You can omit pressing 0 for the right-hand digit.



In Modes 1, 2, 5 and 6, the ENT button can be used to increment the number of the submode.



Changer Error History Reference mode

Player #1 Error History Reference mode

Player #2 Error History Reference mode

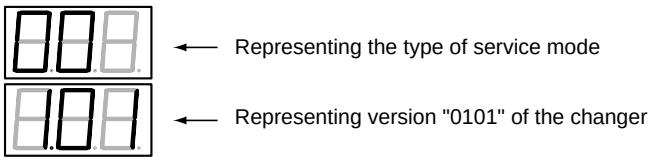
Decoder Error History Reference mode

In the modes other than above, the [ENT] button cannot be used to increment the submode number. Press the [ESC] button to return to Mode 0, then directly input the desired mode number.

To quit Service mode to return to Normal mode, press the ESC button while in Initial mode (Mode 0).

(3) Indication of Version and Serial Number (Mode 0)

This is the initial status displayed immediately after entering Service mode. The firmware version is displayed. The version of the changer is displayed on the mode indicator and on the screen of a monitor connected via the monitor output port. The firmware version of the decoder and players #1 and 2 are displayed on the screen of a connected monitor. The serial number is also displayed on the monitor.



In this system, the firmware version is expressed in four numerics. The fourth and third digits represent the version of the distributed application.

SERVICE MODE 0

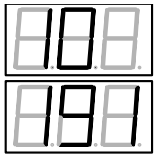
MODEL NAME	MAC-V700	
SERIAL NO.	SETT000001JP	
	VERSION	APPLI
MAIN	0101	
CHANGER	0101	
PL1	0101	01
PL2	0101	01

(4) Error History Reference Mode (Mode 1)

Changer errors, player #1, 2 errors and decoder errors are separately stored in the error history. Each error history has memory for 15 items (1 to F), and these are displayed on the mode indicator and on the screen of a connected monitor. The latest error is indicated as No. 1, and each time a new error occurs, the list is renumbered, and the oldest error code exceeding number F is discarded. Consecutive errors of the same error code will not be repeated in the error history, since a repeating error could crowd out valuable information from the limited space. An error code is expressed in two digits, and no error is indicated as "– –."

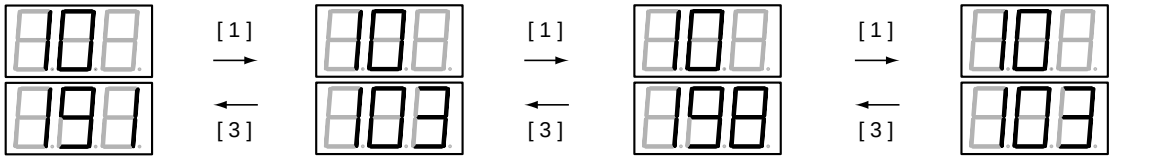
Changer, player #1, 2 and decoder error codes are classified with submode numbers: Submode No. 0 represents changer errors, No. 1 and 2 represent errors with the respective player, and No. 3 represents decoder errors.

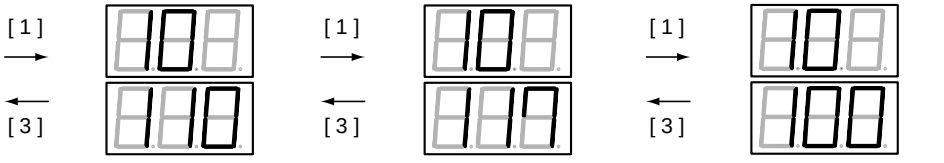
To see the error code history successively from 1 to F, use the [7] and [9] buttons. For details of the meanings of the error codes, see "List of Error Codes" in the appendix.

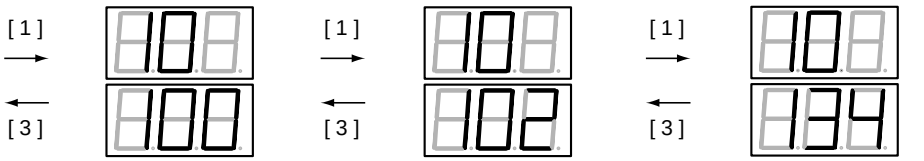


Error history No. (1 to F): Press the [7] button to increment the number or the [9] button to decrement. The higher the number, the older the information.

While an error code is displayed, if the [1] and [3] buttons are pressed, the following information will be displayed:



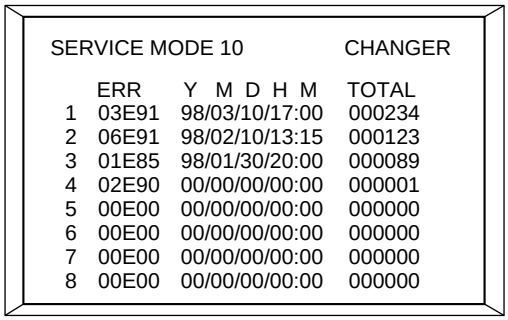



[1]
[3]
Total power-on hours upon error occurrence
Total power-on hours upon error occurrence
Total power-on hours upon error occurrence

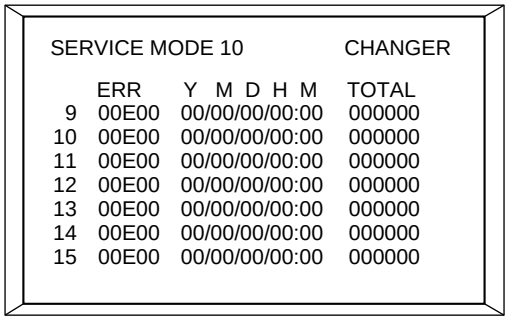
Note: The above error code represents that an error "03E91" occurred at 17:00, March 10, '98 (total power-on time: 000234h).

On the screen of a monitor connected via the monitor output port of the unit, error occurrence time and detail error code are displayed together. These are displayed as "○○□□", "□□" meaning an error code in general, and "○○" meaning a detail error code.

Screen showing an error history



→ SERVICE MODE 10 CHANGER
SERVICE MODE 11 PL1
SERVICE MODE 12 PL2
SERVICE MODE 15 DEC



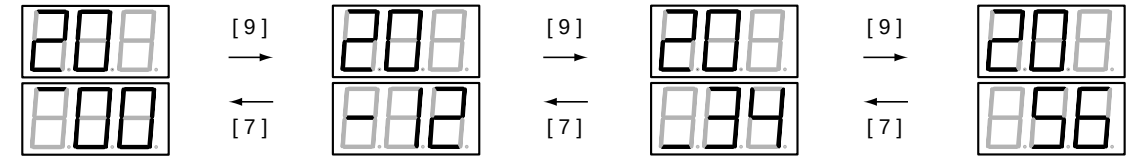
An error occurrence date (year, month, day), is recorded when an error occurs during operation with the control unit connected.

(5) Time, Number Reference Mode (Mode 2)

Total power-on hours, playback hours of each player and number of disc setting are stored in memory to help determine when maintenance for the changer is due. They are displayed on the mode indicator and the screen of a monitor connected via the monitor output port. There are erasable and nonerasable counters for playback hours of each player and number of disc settings.

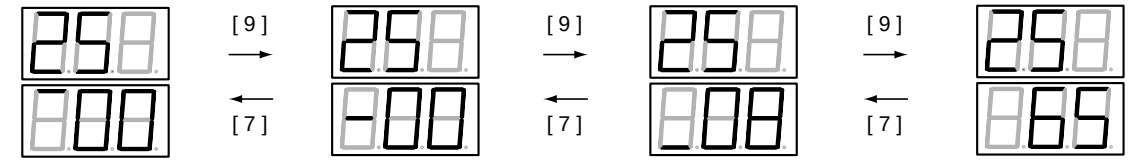
Total power-on hours are counted whenever the unit is on. This value is recorded as total power-on hours when an error occurs, along with the error information.
The playback hours of each player are counted while the spindle motor of the player is rotating. The status of the spindle motor can be monitored with the XSPST signal output from the player.
The iteration of disc settings is incremented each time a disc is set.

During Time Indication mode, the time is indicated in 6 numerics in hours and minutes. When the [ENT] button is pressed, the first and second digits are displayed. To show the remaining digits, press the [9] button. The following example represents "1234 hours 56 minutes" as total power-on hours. The leftmost digit of the mode indicator shows the significance of digits displayed.



Hour indication (hundred-thousandths, ten-thousandths) | Hour indication (thousandths, hundredths) | Hour indication (+, –) | Minute indication (+, –)

During iteration of disc setting is displayed, number is displayed in two numerics. When the [ENT] button is pressed first, the most significant two digits are displayed, and when the [9] button is pressed, the remaining digits are displayed successively. In the following example, the number of disc setting is 865.



Number indication (ten-millionths, millionths) | Number indication (hundred-thousandths, ten-thousandths) | Number indication (thousandths, hundredths) | Number indication (+, –)

In Modes #21, 22 and 25, when Function switch 7 is set to ON, the erasable counter number is displayed on the mode indicator.
When Function switch 7 is set to OFF, the nonerasable counter number is displayed. On the screen of a monitor connected via the monitor output port of this unit, nonerasable counter number is displayed on the left, and the erasable counter number is displayed on the right.

Total power-on time and iteration of disc setting reference screen

```
SERVICE MODE 2

 TOTAL TIME OF
   POWER APPLY    001234:56

   PLAYBACK PL1   000000:00  000001:00
   PLAYBACK PL2   000123:10  000256:10

   DISC SET       00000865   00000005
```

(6) Changer Information Setting Mode (Mode 3)

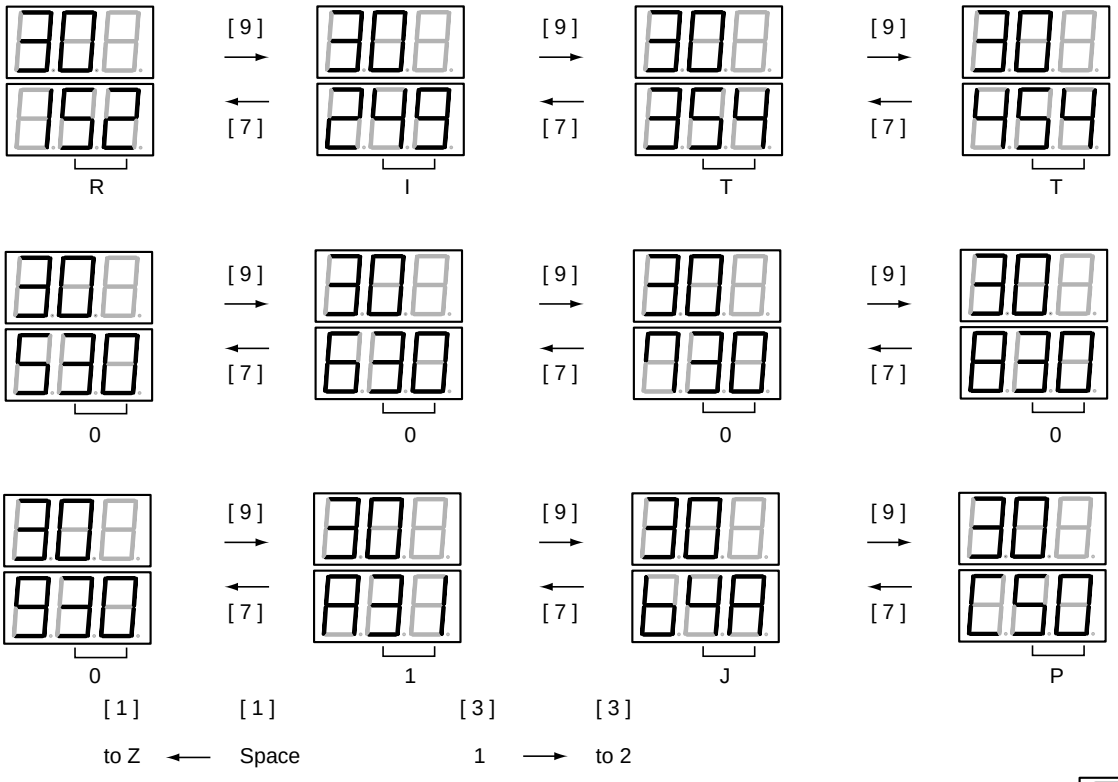
This is the mode for setting the information of the changer.

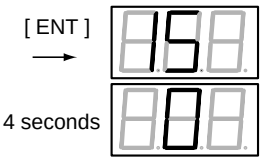
Note: When the HMCB BOARD Assy is replaced, perform this setting.

• Serial Number Setting mode (Mode #30)

To enter this mode, press the [3] button while in initial status, then the [ENT] button. An alphabetic or numeric of the serial number is displayed in ASCII code in the two rightmost digits one by one, and the leftmost digit represents the order of that code on the mode indicator. (The illustration below shows the serial No. RITT000001JP.) To change the serial number, display an ASCII code to be changed by using the [7] and [9] buttons and change the code with the [1] and [3] buttons. After all the necessary codes are updated, press and hold the ENT button for 4 seconds to register the new serial number in memory. After registration, the unit will enter Mode #31.

The serial number and model name being updated will also be displayed on the screen of a monitor connected via the monitor output port of the unit.





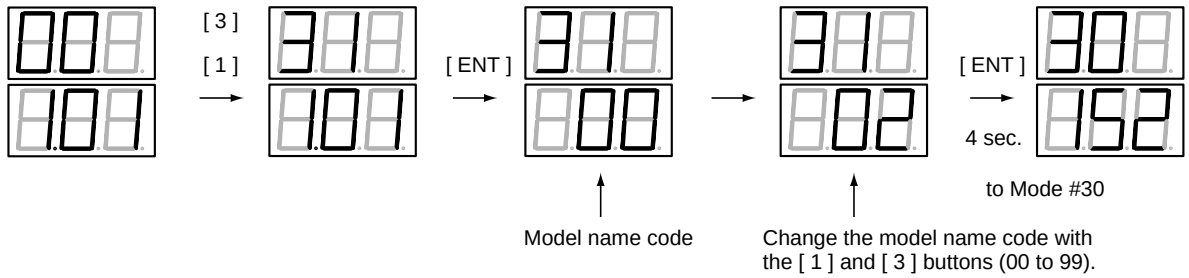
to Mode #31

• Conversion of Characters into ASCII codes

Character	ASCII code	Character	ASCII code	Character	ASCII code	Character	ASCII code
0	30			J	4A	T	54
1	31	A	41	K	4b	U	55
2	32	B	42	L	4C	V	56
3	33	C	43	M	4d	W	57
4	34	D	44	N	4E	X	58
5	35	E	45	O	4F	Y	59
6	36	F	46	P	50	Z	5A
7	37	G	47	Q	51		
8	38	H	48	R	52		
9	39	I	49	S	53	Space	20

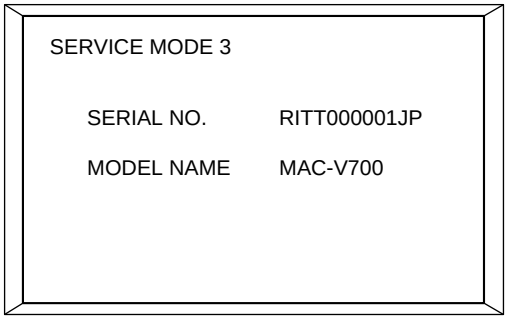
• Model Name Setting mode (Mode #31)

This is the mode for setting the model name of this unit. To enter this mode, press the [3] and [1] buttons successively while in initial status, then the [ENT] button. The model name currently set will be displayed on the mode indicator. To update the model name, use the [1] and [3] buttons. After updating, press and hold the [ENT] button for 4 seconds to register the new model name in memory. After registration, the unit will enter Mode #30.



00 : No model name code
01 : MAC-V60
02 : MAC-V70
03 : Not specified
04 : MAC-V700
05 to 99 : Not specified

The serial number and model name being updated will be displayed on the screen of a monitor connected via the monitor output port of the unit.



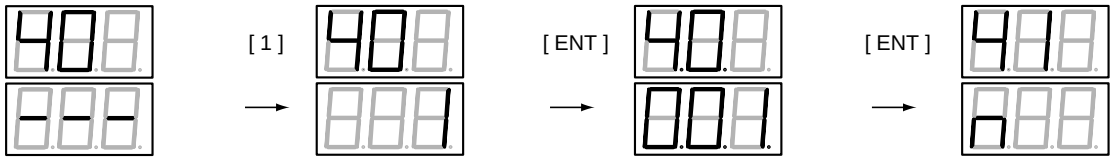
Note: Enter the actual model name code correctly.

(7) Step Manual Operation mode (Mode 4)

This is a mode for performing disc carriage operations in a predetermined order step by step.
Any disc in the disc stocker can be carried to either players #1 or #2. During the disc-return operation, a disc can be returned only to its original address. In this mode, you cannot start a step midway. When "41" is displayed on the mode indicator, it means step 1 of this mode. In most of the steps, "n" is displayed on the mode indicator for a disc-setting operation, and "r" is displayed for disc-return operation.

• Step 0: Disc address input and horizontal movement

When a disc address is entered using the operation buttons, the disc carriage moves horizontally to that address. During horizontal movement, all the dots on the mode indicator blink. Upon reaching that address, the unit automatically enters step 1.
When the [1] button then the [ENT] button are pressed, the indication on the mode indicator changes as follows:

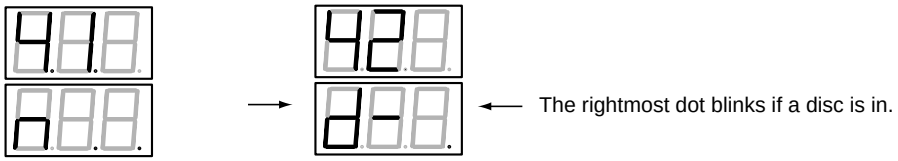


Disc address input — All the dots blink during operation. — Moving to step 1n

Valid disc addresses are 1 through 50. If an invalid address is entered, the unit will not operate when the [ENT] button is pressed, and "– – –" will be displayed. It is possible to enter an address without a disc and to have the unit perform the predetermined steps.

• Step 1n: Pulling out a disc from the disc stocker and checking whether a disc is in

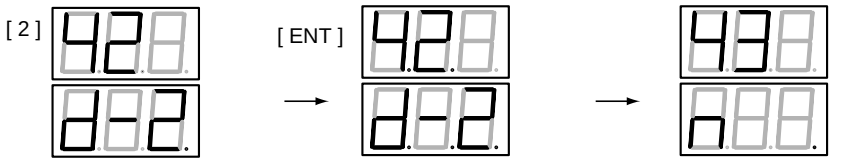
When the ENT button is pressed, the carriage mechanism is activated and pulls a disc from the disc stocker.



All the dots blink during operation. — Moving to step 2n

• Step 2n: Designation of a player and horizontal movement

In this step, a player is designated, and the carriage mechanism moves to that player.
When the [2] button then the [ENT] button are pressed, the indication on the mode indicator changes as follows:

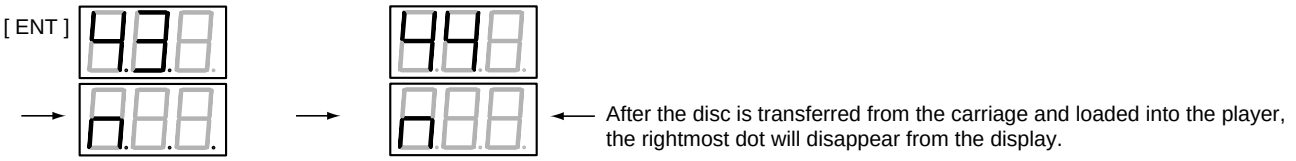


Player No. input — All the dots blink during operation. — Moving to step 3n

Note: If a number for which there is no player is designated, that number will not be accepted.
The designated number may not be accepted if the clamper is closed or if a disc has been already loaded.

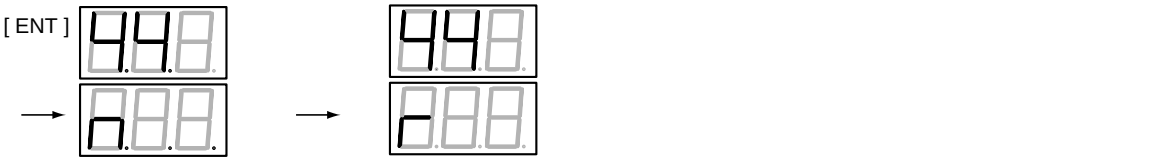
• Step 3n: Loading the disc into the player

When the [ENT] button is pressed, the disc is loaded into the player.


[ENT]
All the dots blink during operation.
Moving to step 4n
After the disc is transferred from the carriage and loaded into the player, the rightmost dot will disappear from the display.

• Step 4n: Clamping the disc

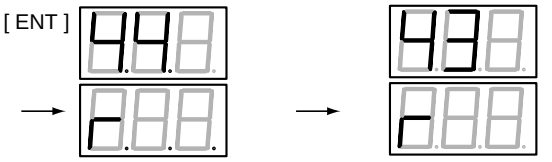
When the ENT button is pressed, the disc in the player will be clamped.



The change of indications from "n" to "r" means that a series of operation for disc setting has been completed, upon which the unit automatically moves to be ready to start a series of return steps. The steps for returning the disc to its original position in the disc stocker will be executed if the [ESC] button is pressed.

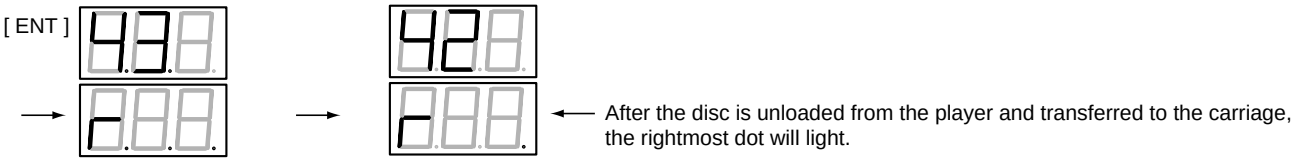
• Step 4r: Unclampling the disc

When the [ESC] button is pressed, the clamper will open.



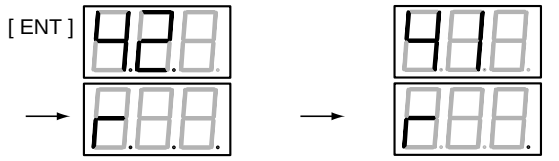
• Step 3r: Unloading the disc from the player

When the [ESC] button is pressed, the disc is pulled out of the player and transferred to the carriage.


[ENT]
All the dots blink during operation.
Moving to step 2r
After the disc is unloaded from the player and transferred to the carriage, the rightmost dot will light.

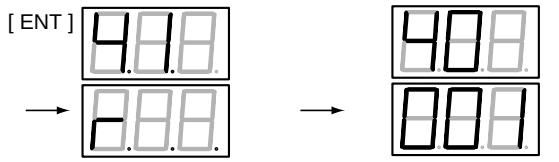
• Step 2r: Horizontal movement to the disc stocker

When the [ESC] button is pressed, the carriage moves horizontally to the address designated in step 0.



• Step 1r: Returning the disc to the disc stocker

When the [ESC] button is pressed, the disc is returned to the disc stocker.



The disc number designated first is indicated on the mode indicator. If the [ESC] button is pressed again, the unit will return to step 0 (initial indication). You can designated a new address.

(8) Super Manual Operation Mode (Mode 5)

In this mode, the motors can be controlled separately. The carriage mechanism is driven by two motors, a horizontal motor and a loading motor. The motor that drives the clamping mechanism of the player is part of the player, but its driving and control circuits are located on the changer. Designate the motor to drive, and press the [7] or [9] button according to the desired direction of rotation of the motor. As the driving voltage is applied only while the button is pressed, you can operate the motor while watching the actual movement and location of the mechanism.

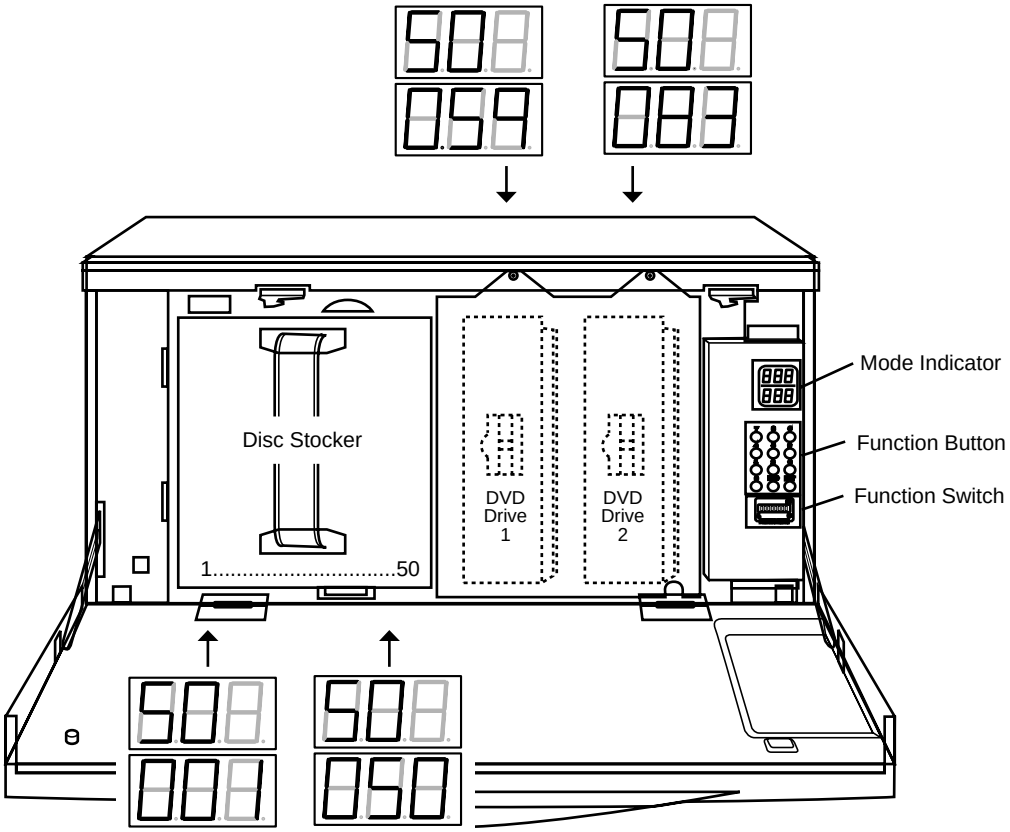
Note 1: In Super Manual Operation mode, as the disc address is not stored in memory while a disc is being carried, you cannot return the disc automatically by turning the power off then on again.

Note 2: In this mode, the priority is given to operational flexibility. Be careful not to damage the mechanism or injure yourself by a wrong operation.

• Manual Horizontal Operation mode (Mode #50)

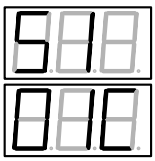
While the [7] button is kept pressed, the carriage moves left, and while the [9] button is kept pressed, the carriage moves right. During the first one second, the carriage moves at the lowest speed. Then the speed is accelerated, but the maximum speed is one-third of the speed of normal horizontal movement. When the button is released, the speed is reduced, and at the point where the speed becomes lowest, the carriage stops at the next address.

On the Mode Indicator, the horizontal address is displayed in real time.



• Manual Loading Operation mode (Mode #51)

To enter this mode, press the [ENT] button while in Mode #50. You can also enter this mode by pressing the [5], [1] and [ENT] buttons consecutively while in initial status (Mode 0). In this mode, it is possible to drive the disc-loading mechanism and to monitor the readout value of the loading mechanism switch in real time.



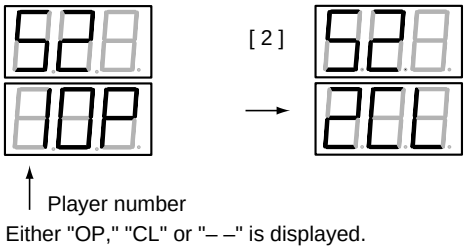
Displays the readout value of the loading mechanism switch (bits 0 to 4 correspond to SW 0 to 4) to indicate the status of the loading mechanism:
0 : Status in which horizontal operation is enabled
– : Status in which horizontal operation is disabled

While the [7] button is held pressed, the carriage mechanism rotates counterclockwise (when viewed from the left side), and while the [9] button is held pressed, it rotates clockwise.

Note: In this mode, operation of the loading mechanism is not restricted. So, a wrong operation may make the disc-chuck mechanism pop out in the rear direction, causing collision. It is safer to remove the housing before entering this mode so that the status of the loading mechanism can be seen. Wrong operation may damage the loading mechanism.

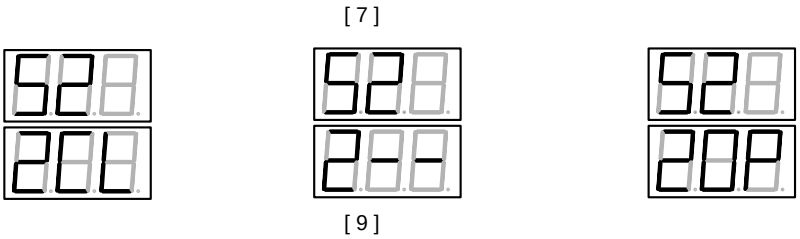
• Manual Clamper Operation mode (Mode #52)

The clamper motors of the built-in players are controlled from the changer. In this mode, you can designate the player number and control opening/closing of the clamper. After entering this mode, the status of the clamper of the built-in player of the lowest number will be displayed. If the [1] or [2] button is pressed, the status of the clamper of that player will be displayed. A number for which there is no built-in player will not be accepted.

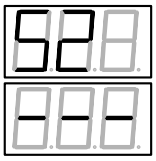


"OP" means open, and "CL" means closed. These represent direct output from the limit switch of the clamper mechanism.
The indication "– –" represents a neutral status where neither of the limit switches is set to ON.

While the [7] button is held pressed, the clamper is held released, and while the [9] button is held pressed, the clamper is held closed.



If no player is built in, the mode indicator shows the following indication:



(9) Status Indication mode (Mode 6)

This is the mode in which the values of the indicators, operation buttons and function switches are read and checked.

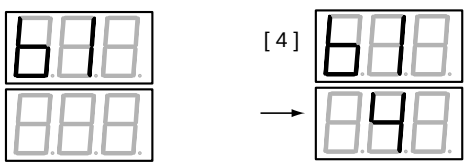
• Indicator Check mode (Mode #60)

The player indicator, player check indicator and error indicator light in that order. The indication on the mode indicator changes at one-second intervals. Check that all the digits show the same indication at all times.

Note: Indicators other than the above are not controlled on the changer.

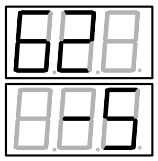
• Operation Button Check mode (Mode #61)

Check that the number of the button pressed is displayed on the mode indicator and disappears when the button is released. Do not press the [ESC] or [ENT] button, however, because they will change the mode.



• Checking whether the disc stocker is in (Mode #62)

In this mode, whether the disc stocker is in or not and its status are displayed. When "S" lights, the disc stocker is in the unit, and when it blinks, the disc stocker is not in. The indication "–" corresponds to the value of the disc-out sensor. When "–" lights, it means normal status, and when "–" blinks, the disc is out of the disc stocker, etc.

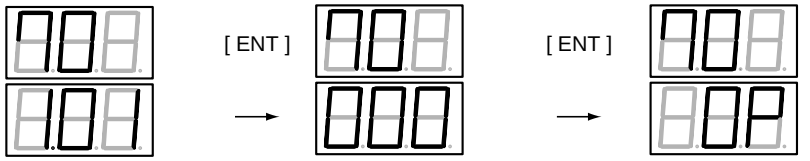


(10) Aging mode (Mode 7)

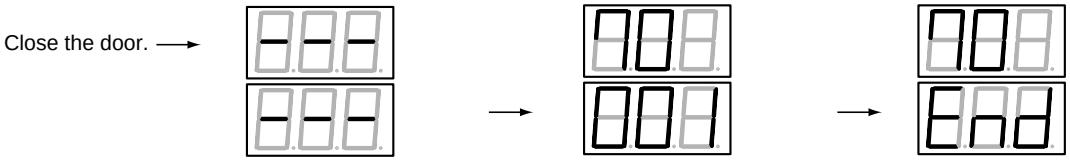
There are three types of aging modes; A, B and C. Aging mode A is used at the factory, and about 6 hours of aging operation is performed and automatically stopped. Aging operation is performed when at least one player is built in. However, the number of operations contained in one cycle differs according to the number of built-in players.

Four discs are required for Aging modes A and B, and fifty discs are required for Aging mode C. There is no restriction on how to insert discs, but basically, in Aging modes A and B, DVDs are inserted in even-number addresses, and V-CDs are inserted in odd-number addresses.

To start aging operation, enter the mode number while in initial status, press the [ENT] button to register the mode, then close the door or set function switch 5 to ON.
The number of the operating cycle being performed is displayed on the mode indicator. Prior to the aging operation, the indication is 000.
If the door is opened and the function switch 5 is set to OFF during aging operation, the operation stops.

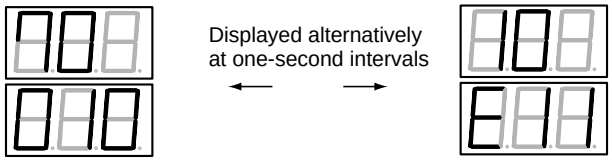


Enter "70" while in initial status.



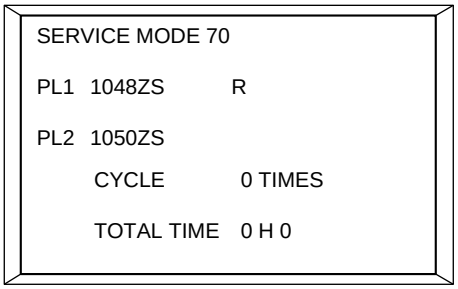
Initialization of the mechanism — Aging operation starts — Aging operation is completed.

Note: If an error occurs during aging operation, the error number and the number of the operating cycle are alternatively displayed on the mode indicator.



Number of the operating cycle — Detail code, error number

All the detailed information is displayed on the screen of a monitor connected via the monitor output port of the unit.



• Aging mode with specified number of cycles (Mode A)

Mode #70 is an aging mode in which the unit operates for the number of cycles specified, then stops. The default number of cycles is 100 (about 6 hours) and the number can be changed in Mode #74. Playback is performed every five cycles.

The basic operational sequence for Aging modes A and B is as follows:

Carry disc from address #48 to the player.	→	Return the disc to address #46 of the disc stocker.
Carry disc #50 to the player.	→	Return the disc to address #48 of the disc stocker.
Carry disc from address #47 to the player.	→	Return the disc to address #45 of the disc stocker.
Carry disc from address #49 to the player.	→	Return the disc to address #47 of the disc stocker.

One cycle is from loading a disc into each built-in player to returning them to the disc stocker. When a discs is returned from a player to the disc stocker, the address for return to the disc stocker is lower by 2 than the address from which the disc left.

The operation starting address can be changed in Mode #75. Default is 50. Set discs from addresses 50 to 47. Discs to be used for aging operation must be DVDs or V-CDs, with which playback of the following chapters should be possible:

DVDs : Playback of Chapter 1 of Title 1 and Chapter 60 of Title 1 for 3 minutes, respectively
V-CDs : Playback of Chapter 1 and Chapter 14 for 3 minutes, respectively

• Aging mode with designation of duration (Mode B)

Mode #71 is an aging mode in which the unit operates for the specified number of hours, then stops. Default is 20 hours (about 600 cycles), and this can be changed in Mode #73.
Playback is performed every 11 cycles.

• Full Loading Aging mode (Mode C)

In this Mode #72, 50 discs are loaded in the disc stocker, and discs are carried to each player and played back. Discs are returned to their original addresses.
Playback is performed every 11 cycles and the number of aging is unlimited.

• Duration Setting mode for Mode #71 (Mode B)

A duration from 1 hour to 99 hours can be set. Default is 20. The duration becomes unlimited when 0 is set.
The number specified in Mode #73 is canceled when you quit Service mode and returned to the default setting.

• Number Setting mode for Mode #70 (Mode A)

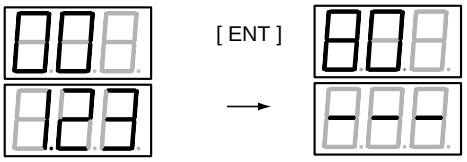
A number of cycles from 1 to 999 can be set. Default is 100. The number becomes unlimited when 0 is set.
The number specified in Mode #74 is canceled when you quit Service mode and returned to the default setting.

• Operation Starting Address Setting mode

The highest address from which the aging operation starts can be set. Default is 100.
The number specified in Mode #75 is canceled when you quit Service mode and returned to the default setting.

(11) Data Erasing mode (Mode 8)

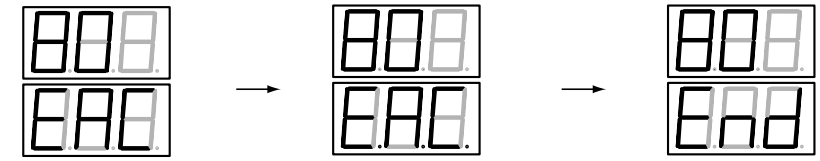
The specified backup data can be erased in this mode. The way to enter this mode is different from other service modes. Press and hold the [ENT] button for about 4 seconds while in initial status (Mode 0) until the indication on the mode indicator changes as follows:



Press and hold the ENT button

Enter the submode number, then press the [ENT] button to go into the desired data erasing submode. To erase data, press and hold the [0] and [ENT] buttons together for about 4 seconds while in submode. Releasing the buttons early will cancel the data erasing.

Submode 0 : Erase the changer error history (indicated as EAC)
Submode 1 : Erase the player #1 error history (indicated as EP1)
Submode 2 : Erase the player #2 error history (indicated as EP2)
Submode 5 : Erase the decoder error history (indicated as Edc)
Submode 6 : Erase the memory of addresses to which discs have been moved (indicated as dCL)
: Erase disc address data stored in the players
Submode 9 : Erase all the data (indicated as ACL) : Erase all the above information



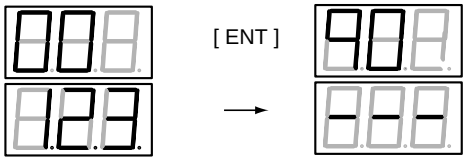
Data Erasing mode

Press the [0] and [ENT] buttons.
The dots blink.

End of erasing

(12) Counter/Time Clear mode (Mode 9)

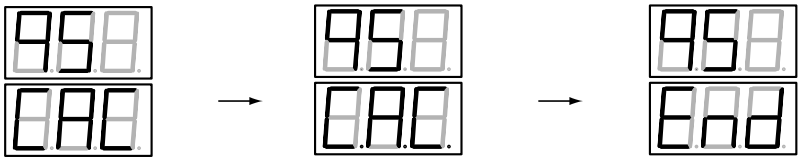
In this mode, it is possible to clear the erasable counter/time specified.
To enter Mode 9, press and hold the [9] button while in initial status for about 4 seconds until the indication on the mode indicator changes as indicated below:



Press and hold the [9] button.

Enter the submode number then press [ENT] button to go into the desired clear mode.
To erase data, press and hold the [0] and [ENT] buttons together for about 4 seconds while in the submode. Releasing the buttons early will cancel data erasure.

Submode 0 :
Submode 1 : Clear erasable playback duration of player #1 (indicated as CP1)
Submode 2 : Clear erasable playback duration of player #2 (indicated as CP2)
Submode 5 : Clear erasable disc-setting number (indicated as CAC)



Press and hold the [0] and [ENT]
buttons together. The dots will blink.

(13) Service Mode Operated from a Remote Control

It is possible to connect an RU-V101 wired remote control to the mini jack inside the door to control the unit. The operational functions that may be controlled from the remote control are listed below:

REJECT	: Spindle stop	RJ<cr>
PAUSE	: Pause	PA<cr>
PLAY	: Playback	PL<cr>
STILL/STEP FWD	: Set a disc	SF<cr>
STILL/STEP REV	: Return a disc	SR<cr>
CLEAR	: Clearing	CL<cr>
FRAME	: a block	FR<cr>
TIME	: Not used	TM<cr>
CHAPTER	: Specify a title and chapter	CH<cr>
SEARCH	: Search	SE<cr>
Numeric buttons	: Number input	0 to 9
DISPLAY (FUNC+1)	: Display control	DS<cr>
VIDEO (FUNC+4)	: Audio/video switch control	VD<cr>
START (FUNC+6)	: Start	SA<cr>
AUDIO (FUNC+7)	: Audio control	AD<cr>
SPEED (FUNC+8)	: Select a player	SP<cr>

• Test Command

Command	Function
CL	Nullifies the arguments entered so far.
△ △ △ SF (ZS)	Disc setting command. The argument must be expressed in 4 numerics.
	◯ = Player number , △ △ △ = Disc number
◯ SR (ZR)	The disc in a player designated by ◯ is returned to the disc stocker.
◯ SP	The player to be controlled is designated by ◯.
RJ	Stops rotating the disc.
SA	Starts rotating the disc.
CH (TR)	Designates a title and chapter of a DVD, or a track of a V-CD.
FR (BK)	Designates a block address.
SE	Commands searching according to the address assignment flag.
	In a case of a DVD
	CH ◯ ◯ □ □ □ SE : ◯ ◯ = title, □ □ □ = chapter
	BK △ △ △ △ △ SE : △ △ △ △ △ = sector address
	In a case of a V-CD
	CH ◯ ◯ SE : ◯ ◯ = chapter
	BK △ △ △ △ △ SE : △ △ △ △ △ = block address
PL	Commands playback. The playback system can be assigned by an argument.
	The argument must be expressed in 1, 2 or 4 numerics.
PA	Commands pause. Pause can be released by 0PA.
◯ AD	Designates the audio channel mode:
	0AD: monaural
	1AD: L channel, monaural
	2AD: R channel, monaural
	3AD: stereo
◯ ◯ DS	Displays the debug display.
◯ ◯ VD	0VD: Output of the external input signal , 1VD: Output of internal playback signal

• DVD/V-CD Player Test mode operated from a remote control

It is possible to connect an RU-V101 wired remote control to the mini jack of the player to control the unit. The operational functions that may be controlled from the remote control are listed below:

REJECT	: Spindle stop	RJ<cr>
PAUSE	: Pause	PA<cr>
PLAY	: Playback	PL<cr>
STILL/STEP FWD	:	SF<cr>
STILL/STEP REV	: Test command	SR<cr>
MULTI-SPEED +	:	MF<cr>
MULTI-SPEED –	:	MR<cr>
CLEAR	: Clear	CL<cr>
FRAME	: Specify a block	FR<cr>
TIME	: Specify a time	TM<cr>
CHAPTER	: Specify a track	CH<cr>
SEARCH	: Search	SE<cr>
Numeric buttons	: Numerical input	0 to 9
START (FUNC+6)	: Start	SA<cr>
OPEN (FUNC+9)	: Open	OP<cr>

• Test Commands

CD mode

Command	Function
0TM	All servo mechanisms off
1TM	LD ON/OFF
2TM	Focus ON/OFF
3TM	CAV spindle ON
4TM	Tracking ON/OFF
5TM	PLL ON/OFF
6TM	Focus UP/DOWN
7TM	Spindle UP/DOWN
8TM	Spindle at normal rotation speed
9TM	Spindle at four times rotation speed

DVD mode

Command	Function
10TM	All servo mechanisms off
11TM	LD ON/OFF
12TM	Focus servo ON
13TM	Spindle FG ON
14TM	Tracking ON/OFF
15TM	Spindle PLL ON/OFF
18TM	Slider FWD mode
19TM	Slider REV mode
33TM	Focus UP/DOWN
43TM	CD mode
44TM	DVD mode
47TM	Auto focus bias adjustment OFF
48TM	Auto focus bias adjustment ON
SF	Jump forward one track
SR	Jump reverse one track
***MF	Jump forward *** tracks
***MR	Jump reverse *** tracks

(*** = three-digit decimal number)

(14) List of Error Codes

In the indication expressed as " ○○E□□," "E□□" is an error code in a strict sense, and " ○○ " is a detail code.
The parameter "**" is a disc address (01 to 50). If a disc address is not known, "FF" is displayed.
The parameter " △△ " is the number (01, 02) of the player.

Error codes for warning : The following error codes are attributed to errors caused by remote operation errors or operation mistakes. These are not stored in an error history.

Indication	Contents
01E40	No data input (serial number, model code, etc.)
01E41	Disc stocker removed during operation
	Disc stocker not installed properly (incl. malfunction of the disc stocker switch)
02E42	Disc out of the disc stocker
E92	No disc (displayed only during an aging mode)

Error codes for "fatal" errors : The following error codes are attributed to errors judged as failures. These are stored in an error history, and operation of the unit is stopped. An error indication is displayed, and if the error occurs in response to a control command, an error code is returned.

Player error history (LUN 1, 2)

Error code	Contents
03E91	Spindle stop timeout
09E91	Clamping operation timeout

Changer error history (LUN 3)

Error code	Contents
01E44	Malfunction of the horizontal address sensor
01E45	Malfunction of the rotary encoder
01E46	Logical failure of the loading sensor
07E91	Loading operation timeout
08E91	Horizontal operation timeout
03E90	Unreturnable disc on the carriage (incl. malfunction of the disc sensor of the carriage)
04E90	Disc in a player cannot be clamped (incl. malfunction of the disc sensor of the carriage)

Error codes for information : The following error codes are attributed to errors caused by operational mistakes or inferior discs. These codes are stored in an error history, but operation of the unit continues.

Decoder error history (LUN 0)

Error code	Contents
01E70	Defective SCSI IC
02E70	Defective decoder IC
03E70	Other defective IC
03E71	Inferior data from SCSI (PGCI or AV attribution data, etc.)
07E85	Overflow of SCSI interface buffer
08E85	SCSI interface parity error
01E88	Abnormal temperature
08E87	Failure in renewing flash memory
△△E89	Automatic cutoff of a player after failure (operation with only one player)

Player error history (LUN1, 2)

Error code	Contents
**E11	Impossible to focus
**E12	Search operation timeout
**E13	Malfunction of focus system
**E14	Malfunction of spindle system
**E17	Data error during data readout
**E18	Impossible to read out data
**E19	Malfunction of tracking system
**E60	E82-related: Decoding does not start.
**E61	E72-related: Normal completion received although not everything has been read.
**E62	E72-related: Interrupt during reading did not come, resetting was done, and communication recovery was made.
**E63	E72-related: Interrupt during reading did not come, and recovery was made with backup reading.
**E64	E72-related: The first interrupt does not come (the first SCSI data reading included).
**E65	Occurrence of a SCSI parity error
**E66	E82-related: The video decoding during playback has stopped for a fixed time.
01E71	Player was reset.
02E71	Error in the player during data readout
03E71	Unexpected response received from the player
**E72	Error during data readout from the player
**E73	Error in the transmission system inside the player
**E74	Abnormal number of data transferred between the player and the DECB
**E75	Disc in incompatible format (CD-DA, etc.)
**E76	Authentication-related error received from the player
**E77	DVD with a region number that cannot be played back set
**E78	Data required for playback not found
**E79	Error detected at a decoder-related IC
**E80	Count error during data readout
**E81	Timeout during processing inside the player
**E82	Error with a video code being played back
**E83	Navigation data cannot be read.
01E84	No connection to the ATAPI connector of the player.
02E84	Poor connection to the ATAPI connector of the player
05E84	ATAPI connector of the player not connected. (01E84-related: No escape from busy at the time of initialization.)
09E84	ATAPI connector of the player not connected. (01E84-related: The packet command does not pass at the time of initialization.)
05E85	Failure in communication in the ATAPI system
06E85	Inferior data in the ATAPI system
09E85	Defective communication of the ATAPI system (the packet command does not pass.)
08E87	Failure in renewing flash memory
**E95	Abnormal RF level detected
**E96	No startup (TOC cannot be read)

Changer error history (LUN 3)

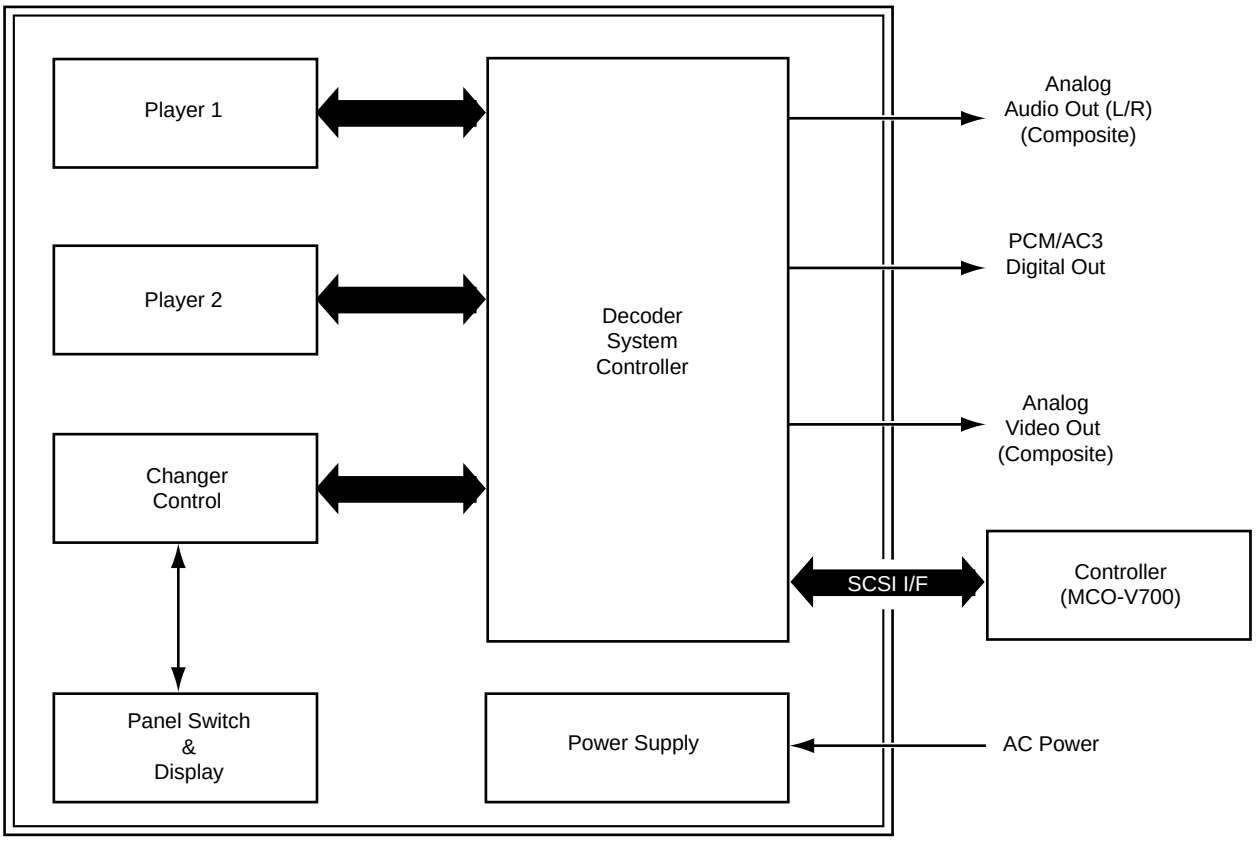
Error code	Meaning
03E85	Transmission framing error between DECB and HMCB
04E85	Transmission overrun error between DECB and HMCB
02E90	Failure in data readout from the EEPROM (erasure)
08E87	Failure in renewing flash memory (update area)
09E87	Failure in data readout from flash memory (erasure)

Sense Code	Meaning	Error Code	Corresponding Error Code or Meaning
02-04-01	Logical unit is in process of becoming ready	01E71	Initial status (Player is reset)
02-04-80	Logical unit not present		Player not connected
02-3A-00	No disc in logical unit		No disc set
		**E11	Impossible to focus
02-57-00	Unable to recover TOC	**E96	Impossible to start up (unable to read TOC)
03-11-05	L-ECC uncorrectable data error	**E17	Data correction error during data readout (L-ECC)
03-11-06	CIRC unrecovered data error	**E17	Data correction error during data readout (CIRC)
03-14-01	Record not found	**E18	Impossible to read out data
03-15-01	Error occurred during seek operation	**E12	Search operation timeout
04-08-00	Logical unit communication failure	**E64	E72-related: The first interrupt does not come
		01E84	No connection to the ATAPI connector of the player.
		02E84	Poor connection to the ATAPI connector of the player
		05E84	ATAPI connector of the player not connected.
		09E84	ATAPI connector of the player not connected.
		05E85	Failure in communication in ATAPI system
		09E85	Defective communication of the ATAPI system
		06E85	Inferior data in ATAPI system
04-08-01	Logical unit communication time-out		A command to an uncommunicative LUN received
04-09-01	Track servo failure	**E19	Malfunction of the tracking system
04-09-02	Focus servo failure	**E13	Malfunction of the focus system
04-09-03	Spindle servo failure	**E14	Malfunction of the spindle system
04-18-00	Synchronous data transfer error	07E85	Overflow of the SCSI interface buffer
04-40-02	Drive's internal data bus failure	**E61	E72-related: Normal completion received although not everything has been read.
		**E62	E72-related: Interrupt during reading did not come, resetting was done, and communication recovery was made.
		**E63	E72-related: Interrupt during reading did not come, and recovery was made with backup reading.
		02E71	Error inside the player in data readout
		**E72	Error in data readout from the player
		**E73	Communication error inside the player
		**E74	Error in data readout from the player
		**E80	Count error in data readout
		**E81	Timeout during processing inside the player
04-44-00	Internal target failure	03E71	Unexpected response received from the player
04-47-00	SCSI interface parity error	08E85	SCSI interface parity error
05-20-00	Invalid command operation code		Invalid operation code
05-21-00	Element address is out of range		Nonexistent element address assigned
05-24-00	Illegal field in command packet		Illegal field in CDB
05-25-00	Invalid logical unit number		Invalid command for the assigned LUN received
05-2C-00	Command sequence error		Unexecutable command received
		**E77	A DVD with a region number that could not be played back set
		**E78	Data to be played back not be found
05-30-02	Cannot read medium incompatible format	**E75	Disc with incompatible format (CD-DA, etc.)
05-64-00	Illegal mode for this track	**E75	Disc with incompatible format (CD-DA, etc.)
05-6F-00	Authentication failure	**E76	Authentication-related error received from the player
		**E79	Error detected at decoder-related IC

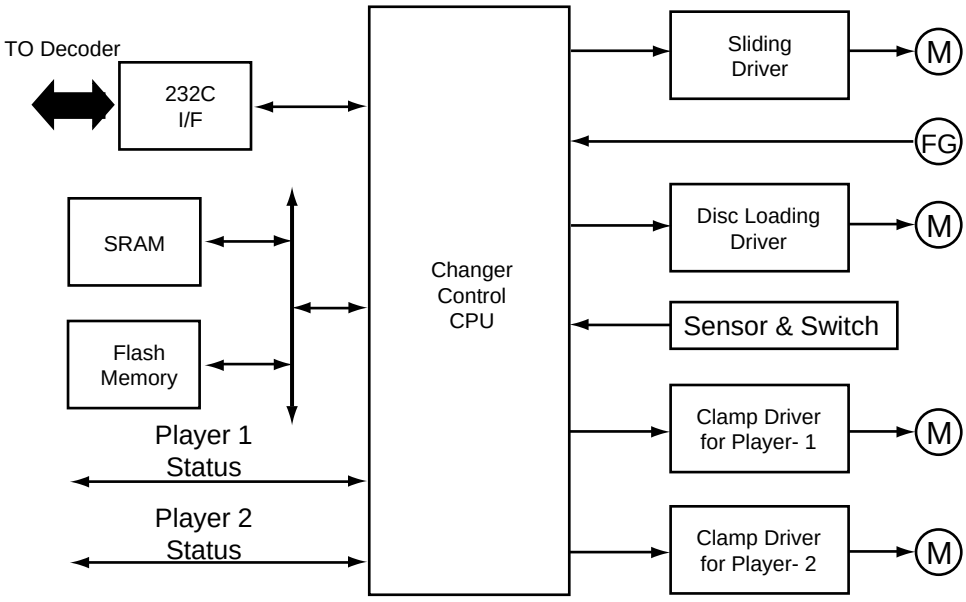
Sense Code	Meaning	Error Code	Corresponding Error Code or Meaning
05-6F-01	Key not present	**E76	Authentication-related error received from the player
05-6F-02	Key not established	**E76	Authentication-related error received from the player
05-6F-03	Authentication not end	**E76	Authentication-related error received from the player
0B-48-00	Initiateor detected error	**E65	Occurrence of a SCSI parity error
0B-4A-00	Commnd phase error		CDB length different from that specified for the group
0B-4B-00	Data phase error	**E61	E72-related: Normal completion received although not everything has been read.
		**E62	E72-related: Interrupt during reading did not come, resetting was done, and communication recovery was made.
		**E63	E72-related: Interrupt during reading did not come, and recovery was made with backup reading.
		**E72	Error in data readout from the player
		04E71	Inferior data from SCSI
05-53-82	Door open		Door opened
02-53-83	DISC mounted uncorrectly	01E41	Disc stocker not mounted correctly
		02E42	Disc out of disc stocker
02-53-90	Aging mode		In the process of aging mode
02-53-91	Service mode		In the process of service mode
04-15-01	Mechanical positioning error	01E40	No input for the serial number and model code
		01E44	Malfunction of horizontal address sensor
		01E45	Rotary encoder failure
		01E46	Logical failure of the loading sensor
		02E90	Abnormal readout data from the EEPROM (erasure)
		03E90	Unreturnable disc on the carriage (sensor failure)
		04E90	Disc in the player cannot be clamped (sensor failure)
		03E91	Spindle stop timeout
		07E91	Loading operation timeout
		08E91	Horizontal operation timeout
		09E91	Clamping operation timeout
04-87-00	FLASH MEMORY write error	08E87	Failure in renewing flash memory
		09E87	Abnormal data readout from flash memory (erasure)
04-90-00	Decode error	**E82	Error in video code playback
04-90-01	Stream error	**E83	Navigation data could not be read.
05-26-02	Parameter value invalid		Renewed data of flash memory poor
05-3B-0E	Medium source element empty		No disc
			Disc being used in another player
04-F0-**	Program sequence error		A problem in program sequence
			Detailed data indicated in "**"

7.3 BLOCK DIAGRAM

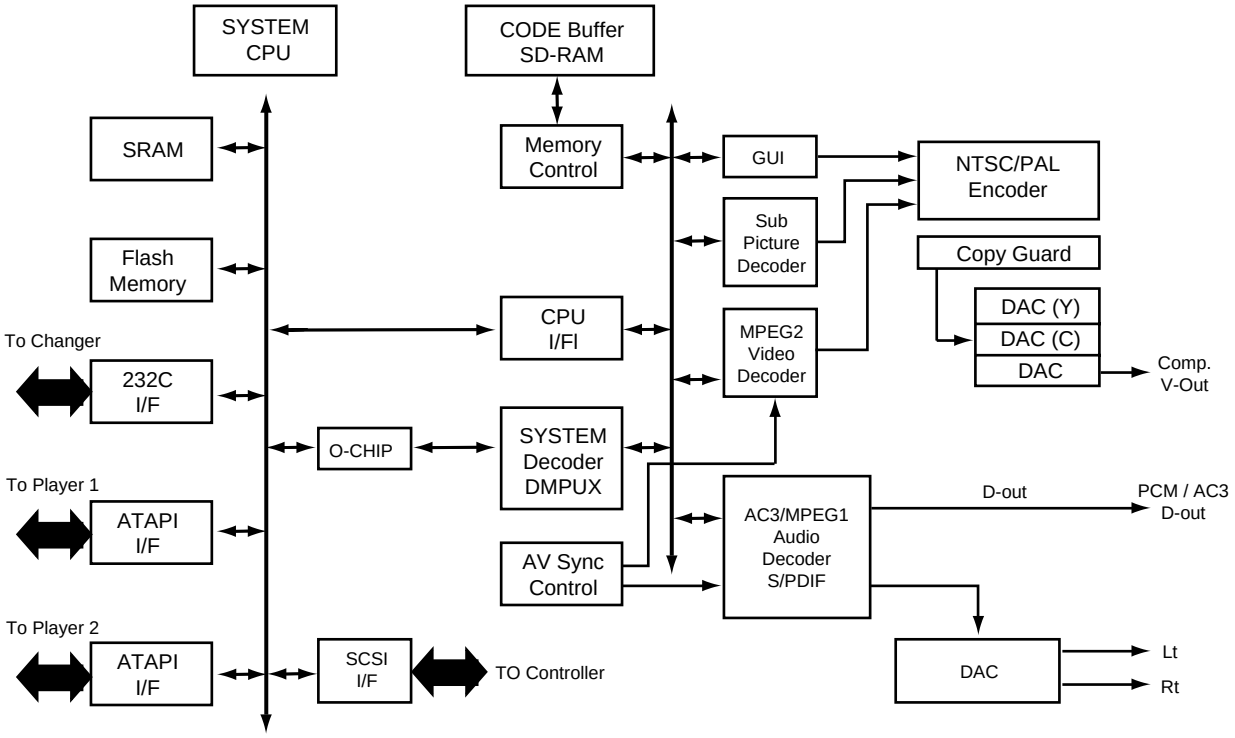
DVD Auto Changer Block



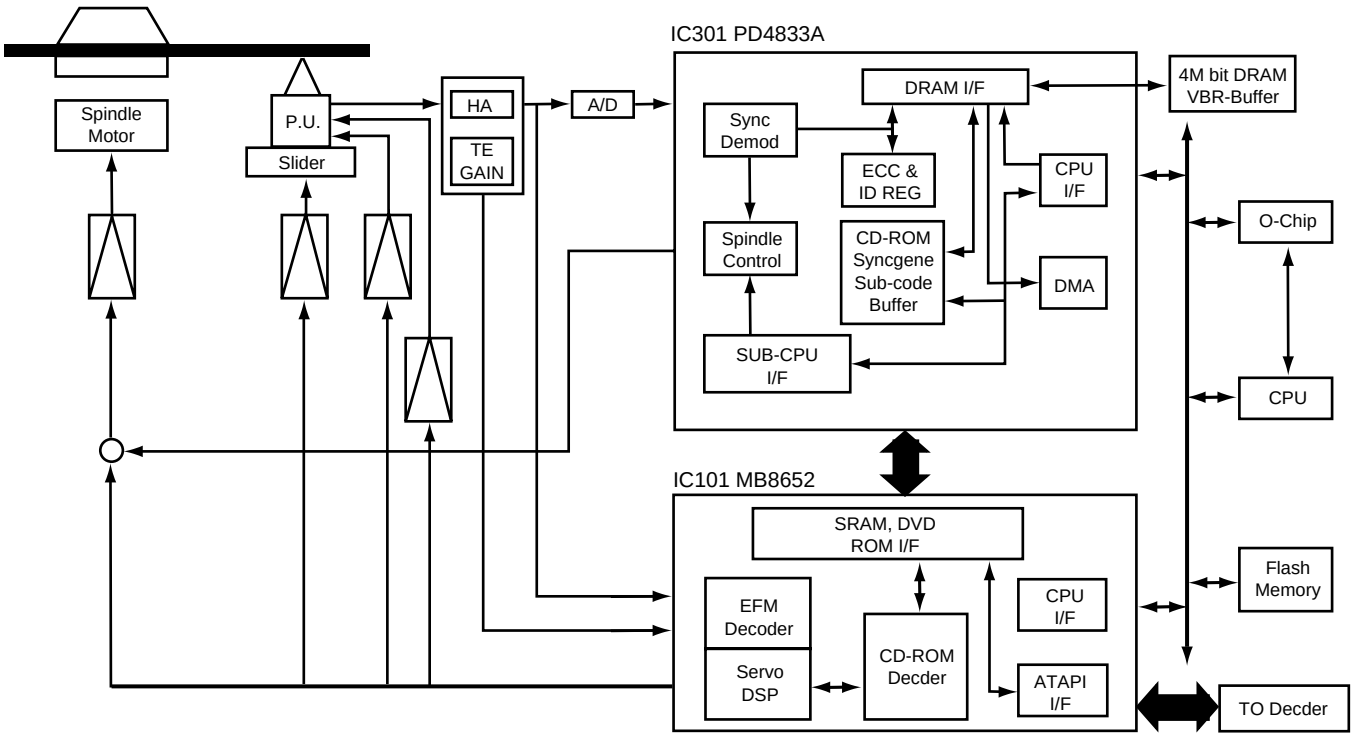
Changer Mechanism Controller Block



Changer Decoder Block

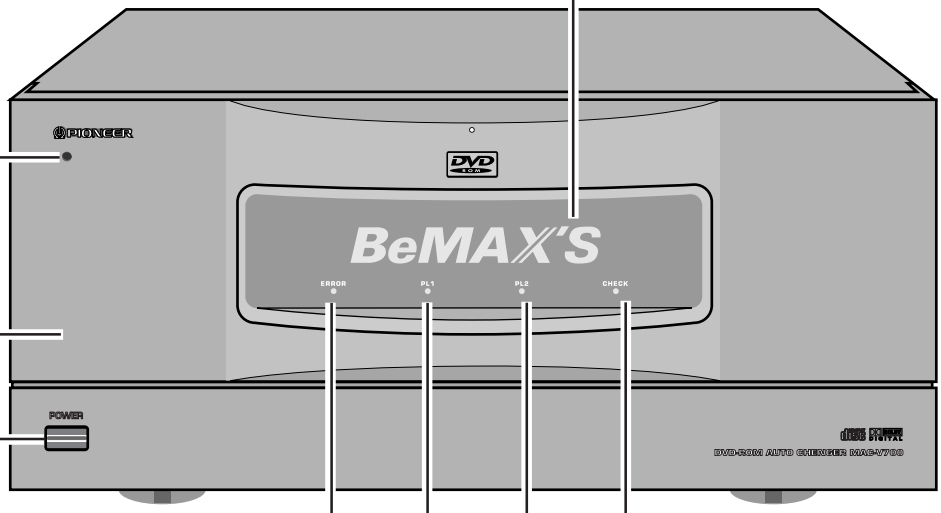


DVD PLAYER Block



8. PANEL FACILITIES AND SPECIFICATIONS

■ FRONT PANEL



Power indicator (illumination)
The illumination comes on when the power is turned on.

Keyhole
The key is inserted into this hole to open the door.

Door

POWER switch
Normally, this is kept at the ON position (since it is connected to the outlet coupled to the operation of the power switch on the MCO-V700 controller).

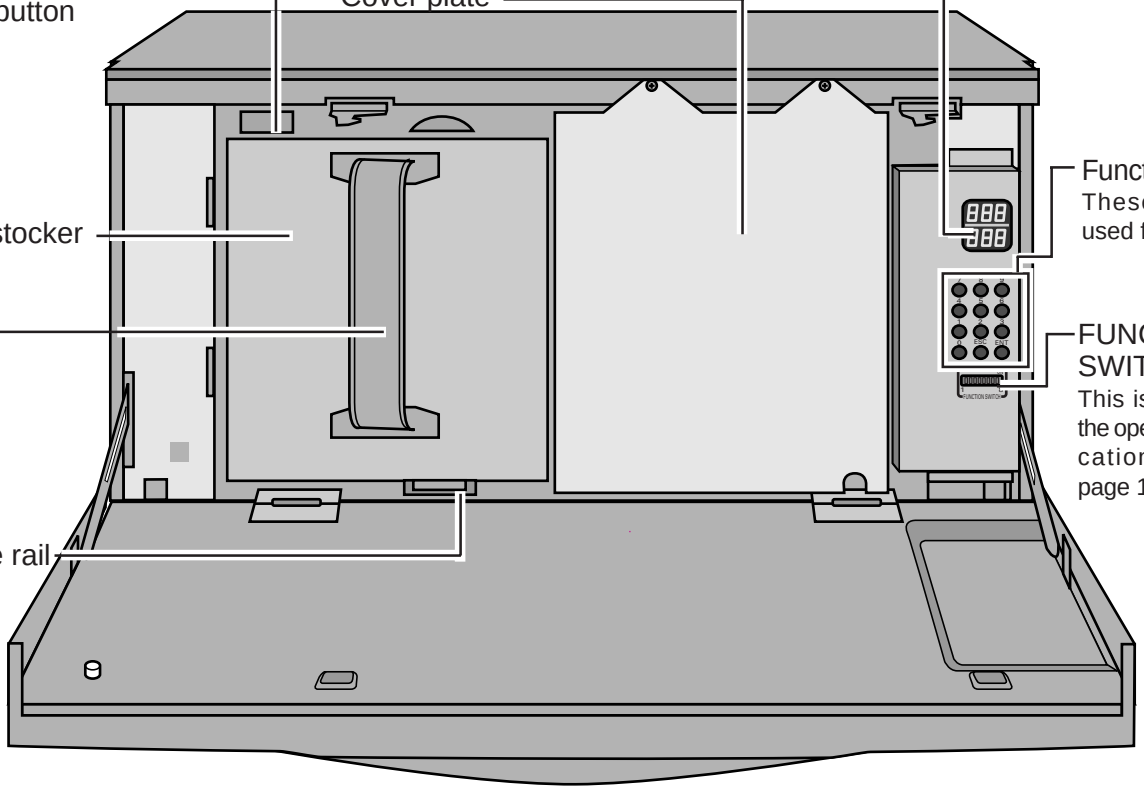
ERROR indicator
This flashes when an error has occurred.
- It also flashes when the disc stocker or discs have not been inserted properly. In this case, open the door and insert the disc stocker or discs properly.

PL1 indicator
This lights while the first built-in DVD-ROM drive unit is being activated.

CHECK indicator
It is time to clean the lens when this has lighted. Contact your dealer and have the unit inspected.

PL2 indicator
This lights while the second built-in DVD-ROM drive unit is being activated.

[WITH DOOR OPEN]



Mode indicator
This lights when an error has occurred, when the door has been opened or closed or during initialization.

Disc stocker eject button

Cover plate

Function buttons
These are mainly used for servicing.

Disc stocker

Grip

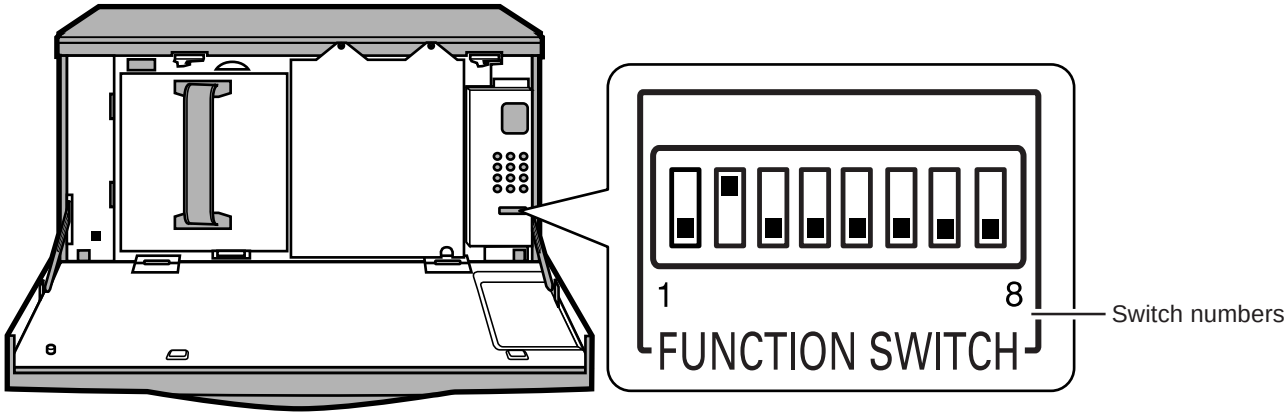
FUNCTION SWITCH
This is used to set the operating specifications (refer to page 120).

Guide rail

[Function Switch]

The operating specifications can be selected by setting the function switches.
These switches cannot be operated without opening the front door.
There are 8 function switches: switch 1 is at the far left and switch 8 is at the far right. The factory settings for all switches except swith 2 is the lower position. only switch 2 is set to the upper position.
(The auto changer's function switches are preset at the factory to enable use of a single auto changer.)

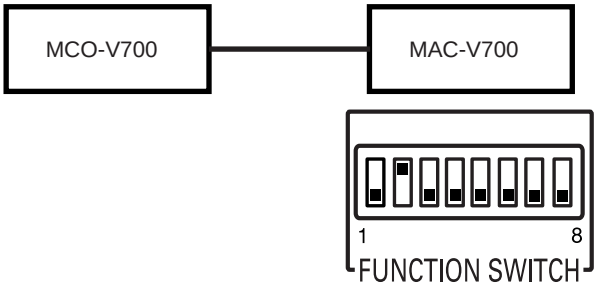
Switch No.	Function
1	SCSI terminator setting
2	SCSI ID number setting
3	
4	These are not normally used and must be set to the lower position.
5	
6	
8	



[Setting the Function Switch]

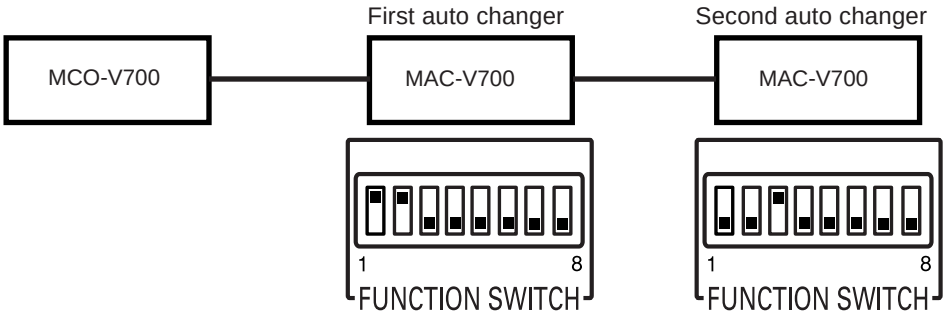
■ The function switch must be set correctly: otherwise the unit will not operate properly.

When one auto changer is connected



Set only switch 2to the upper position.
(leave them at the factory settings).

When two auto changers are connected



Set only switches1 and 2 to the upper position.

Set only switch 3 to the upper position.

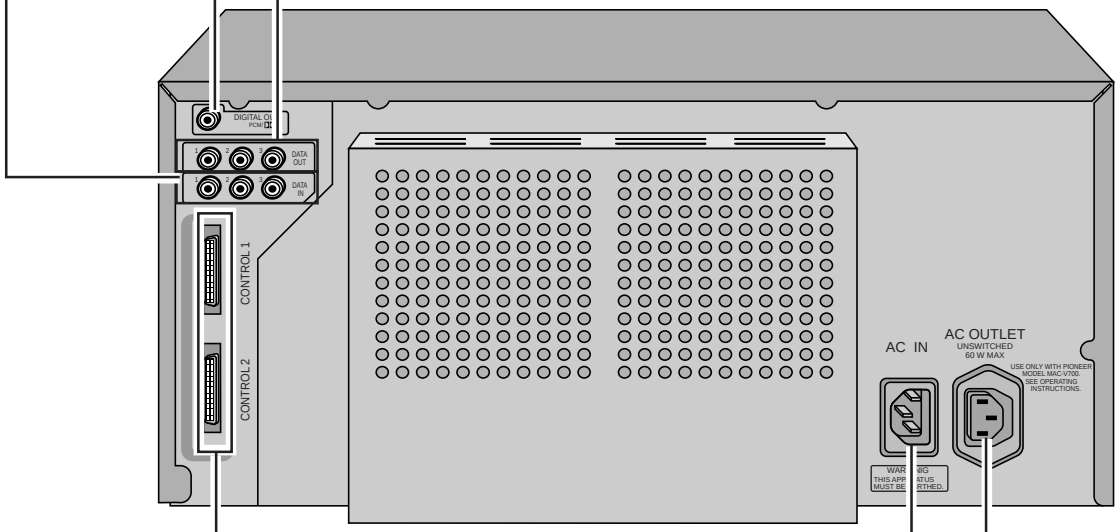
REAR PANEL

DATA input connectors
The video and audio output signals of another (additional) DVD-ROM auto changes are connected here.

DATA1: Audio Rch
DATA2: Audio Lch
DATA3: Video

These connectors are provided for use in the future.

DATA output connectors
These are the playback output connector for background video or control music.



CONTROL 1, 2 connectors
These are half-pitch 50-pin (comb-shaped) SCSI connectors: one is connected to the DVD/CD-ROM control connector on the controller (MCO-V700), and the other is connected to the CONTROL connector of another (additional) DVD-ROM auto changer. The control cable provided with the unit must be used as the connecting cable.

Incoming power socket (AC IN)
This is connected to the dedicated power outlet on the controller (MCO-V700) using the accessory power cord.

Power outlet (AC OUTLET)
The power cord of another (additional) DVD-ROM auto changer is connected here.
Do not connect any unit other than the DVD-ROM auto changer to this outlet.

SPECIFICATIONS

General

Description ..... DVD/CD auto changer
Discs used..... Dedicated 12 cm BeMAX'S DVD-ROMs, dedicated 12 cm BeMAX'S DVD video discs (region No. 3), dedicated 12 cm BeMAX'S CD-ROMs/video CDs
Disc storage capacity ..... Max. 50 discs
Power requirements ..... AC 110–240V, 50/60 Hz (Use AC 110V, 60Hz setting for Taiwan.)
Power consumption..... 32 W
Weight (excluding discs) ..... 17.2 kg
Dimensions (W x H x D) ..... 420 x 228 x 463 mm
Operating temperature range ..... +5 to +35 degrees Celsius
Operating humidity range ..... 5% to 85% (no condensation)
Video output
  Output level..... 1 Vp-p (with 75-ohm load, negative sync)
  Output connector ..... RCA pin jack
Audio output
  Output level..... 1.8 Vrms
  Output connector ..... RCA pin jack
Video input
  Input connector ..... RCA pin jack
Audio input
  Input connector ..... RCA pin jack
Other connectors
  Control connector ..... Half-pitch SCSI 50-pin connector (comb-shaped)
  Digital output ..... RCA pin jack

Accessories

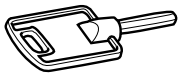
Door key 1
Control cable 1
Video cord 1
Audio cord 1
Power cord 1
Operating Instructions 1

The above specifications and product appearance may be changed without notice due to improvements.

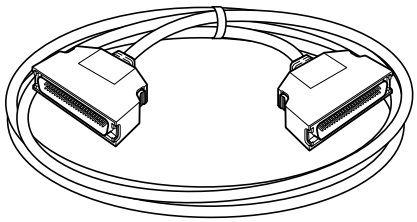
Regular inspection
In order to keep the product functioning and performing at its peak and to extend its service life, regular maintenance and inspections are recommended.

[Accessories]

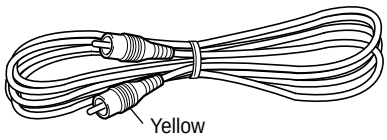
Door key (x1)
(DNK1698)



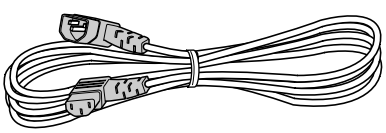
Control cable (x1)
(DDC1008) (L=2m)



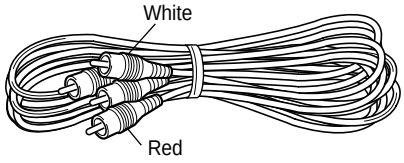
Video cord (x1)
(ADE1059) (L=2m)



Power cord (x1)
(DDG1079)



Audio cord (x1)
(DDE1112) (L=2m)



Operating Instructions